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2 Contributions by Individuals: Estimates of the Effects of Taxes

Gifts by living individuals account for the lion's share of charitable contributions in the United States. Accordingly, the present examination of the effect of taxes on contributions begins by considering just such contributions. Section 2.1 provides some statistical background by tracing the growth of individual contributions over time and describing its distribution by various characteristics. Section 2.2 provides a brief description of the provisions of the tax law affecting charitable contributions. The next section discusses the theoretical analysis of the effect of income tax provisions on contributions within a standard economic model of individual behavior. The implications of alternative behavioral assumptions are also considered. Section 2.4 describes the data, estimation methods, and basic results of econometric studies of giving by individuals. In discussing both the theoretical and empirical models, the effects of the tax-defined price of giving and net income are afforded special attention. And section 2.5 continues this discussion by focusing on particular issues of behavior and estimation technique arising from this work. The final section discusses econometric work on the effect of tax policy on charitable giving for other countries. Discussion of the implications for tax policy of observed giving behavior is deferred to chapter 3.

2.1 The Size and Distribution of Individual Contributions

As in all other areas of empirical study, our knowledge about the magnitude of charitable contributions is limited by the availability and quality of data on the subject. If one accepts the definition of contributions in the tax law—gifts to certain nonprofit organizations, but not direct gifts to other individuals—contributions may readily be measured for taxpayers who itemize their deductions. For households who do not itemize their de-

ductions, however, information on giving is rarely available. In order to give a general idea of the magnitude of contributions over time in the United States, table 2.1 presents estimates from three sources. Although the series shows that these appear to be roughly comparable to each other, there is considerable variation in the methodologies that have been used to

Table 2.1 **Estimates of Contributions by Individuals, 1929–81 (current dollars, in billions)**

Year	Andrews Estimate (1)	*Giving U.S.A.* Estimate (2)	Personal Income (3)	Estimated Contributions (2 or 3) as Percentage of Personal Income (4)	Nelson Estimate (5)
1929	1.067		85.8	1.24	
1930	.981		76.9	1.28	
1931	.843		65.7	1.28	
1932	.702		50.1	1.40	
1933	.637		47.2	1.35	
1934	.662		53.6	1.24	
1935	.727		60.2	1.21	
1936	.830		68.5	1.21	
1937	.943		73.9	1.28	
1938	.884		68.6	1.29	
1939	.967		72.4	1.34	
1940	1.064		77.9	1.37	
1941	1.556		95.4	1.63	
1942	2.108		122.6	1.72	
1943	2.535		150.8	1.68	
1944	2.691		164.5	1.64	
1945	2.772		170.0	1.63	
1946	2.929		177.6	1.65	
1947	3.240		190.1	1.70	
1948	3.319		209.0	1.59	
1949	3.447		206.4	1.67	
1950	3.688		227.2	1.62	
1951	4.286		254.9	1.68	
1952	4.545		271.8	1.67	
1953	4.779		287.7	1.66	
1954	4.789		289.6	1.65	
1955		5.71	310.3	1.84	
1956		6.08	332.6	1.83	
1957		6.52	351.0	1.86	
1958		6.79	361.1	1.88	
1959		7.26	384.4	1.89	
1960		7.63	402.3	1.90	7.89
1961		7.96	417.8	1.91	8.13
1962		8.50	443.6	1.92	8.58

(*cont.*)

Table 2.1 (*continued*)

Year	Andrews Estimate (1)	*Giving U.S.A.* Estimate (2)	Personal Income (3)	Estimated Contributions (2 or 3) as Percentage of Personal Income (4)	Nelson Estimate (5)
1963		9.03	466.2	1.94	8.93
1964		9.55	499.2	1.91	9.55
1965		10.36	540.7	1.92	9.98
1966		11.33	588.2	1.93	10.61
1967		12.15	630.0	1.93	11.33
1968		13.36	690.6	1.93	12.50
1969		14.71	754.7	1.95	13.27
1970		15.92	811.1	1.96	14.0
1971		17.02	868.4	1.96	14.6
1972		18.19	951.4	1.91	15.80
1973		20.43	1065.2	1.92	
1974		22.33	1168.6	1.91	
1975		24.24	1265.0	1.92	
1976		26.57	1391.2	1.91	
1977		29.22	1540.4	1.90	
1978		32.79	1732.7	1.89	
1979		36.39	1951.2	1.87	
1980		39.78	2160.4	1.84	
1981		44.51	2415.8	1.84	

Sources: Col. (1), estimates by F. Emerson Andrews, given in Kahn 1960, p. 63, table 16; col. (2), *Giving U.S.A.* 1982, p. 34; col. (3), 1929–38: U.S. Bureau of the Census 1960, p. 139; 1939–81: U.S. Council of Economic Advisers 1983, p. 185; col. (5), Nelson 1977b, p. 131.

estimate total giving.[1] Thus care should be taken in interpreting these figures. The two basic sets of estimates from Andrews (Kahn 1960) and the American Association of Fund-Raising Counsel's *Giving U.S.A.*, suggest that contributions have risen in relation to personal income between 1929 and 1981. As a percentage of personal income, contributions have increased from about 1.3 to 1.8 percent over the period. Despite this overall increase in the average contribution rate, the trend since 1970 has been negative, with the ratio falling from a peak of 1.96 in 1970 and 1971 to 1.84 in 1980 and 1981.[2]

At any one time, contribution levels obviously vary among individuals. Not surprisingly, they vary markedly by income level. Table 2.2 gives re-

1. For discussions of methodologies used in estimating contributions by individuals, see Kahn (1960, chap. 4), Dickinson (1970), and Nelson (1977a).

2. The shorter series on contributions produced by Nelson implies that the ratio of contributions to personal income fell throughout the 1960–72 period, from 1.96 to 1.66.

Table 2.2 Average Contributions by Household Income, 1973

Income	Average Income	Average Contributions	Average Contributions as Percentage of Average Income
Under $4,000	$ 1,942	$ 75	3.9
$4,000-7,999	5,906	122	2.1
$8,000-9,999	8,974	208	2.3
$10,000-14,999	12,365	327	2.6
$15,000-19,999	17,191	523	3.0
$20,000-29,999	23,685	720	3.0
$30,000-49,999	36,174	1,455	4.0
$50,000-99,999	66,004	5,552	8.4
$100,000-199,999	130,363	16,988	13.0
$200,000-499,999	280,255	38,950	13.9
$500,000 or more	1,008,653	70,501	7.0
All	$ 10,251	$ 459	4.5

Sources: Average income: U.S. Internal Revenue Service, *Statistics of Income—1973, Individual Income Tax Returns* 1976, p. 7; average contributions: Morgan, Dye, and Hybels 1977, p. 161, table 1.

sults taken from the National Study of Philanthropy, a survey taken in 1974 covering contributions in 1973. The table shows that average contributions rose monotonically with income, from $75 for households in the lowest income group to over $70,000 for households with incomes over $500,000. The percentage of income contributed also rose with income between $4000 and $500,000. The ratio falls with income at the lowest income levels, which agrees with similar tabulations using other data.[3] Figure 2.1 uses data for itemized deductions to plot the relationship between income and the proportion of income contributed. In each case, a U-shaped curve is evident over some range.[4]

It may be tempting to make conclusions, using information on the correlation between contributions and income, about the income elasticity of individual contributions. For example, one might conclude from the rise in the contributions-to-income ratio since 1929 that contributions have an elasticity greater than one. This reasoning may yield incorrect conclusions, however. Unlike the determination of the income elasticity for a consumer good where the price of the good is constant, the tax-defined net price of giving created by the charitable deduction typically varies over time and among income classes. In addition, taxes affect the amount of disposable income available after taxes. Indeed, one of the principal ob-

3. See, for example, Clotfelter and Steuerle (1981, p. 406).

4. For further discussion of this U-shaped relationship, see Clotfelter and Steuerle (1981, pp. 405-7). Among the possible factors in explaining the U-shape, the high proportion of older individuals, whose wealth is high relative to their incomes, may be important.

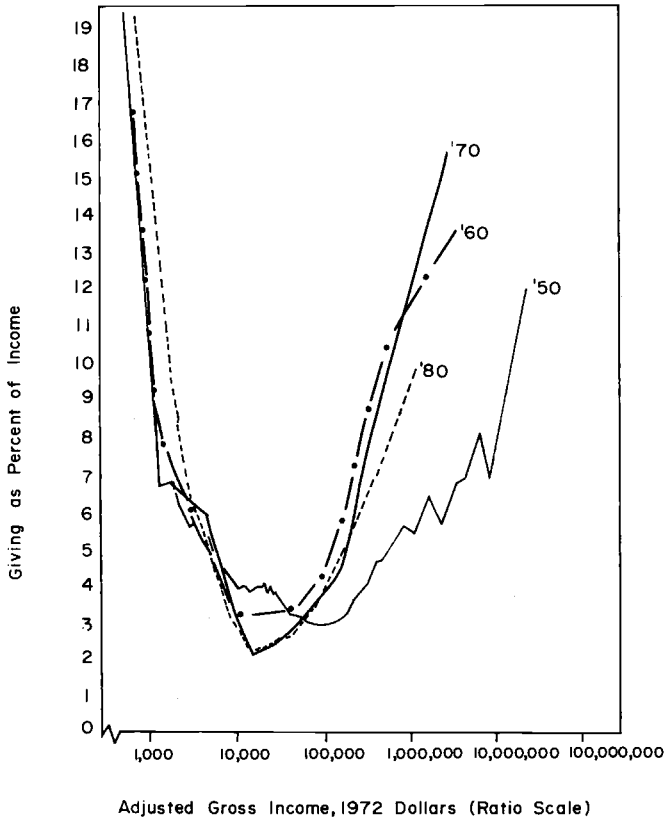


Fig. 2.1 Giving as a percentage of income by income, selected years.

jectives of the econometric analysis of charitable contributions has been to determine the independent effect of taxes.

The examination of average contributions masks significant variability in contributions among households of a given income level. Tables 2.3 and 2.4, which show the distribution of giving in relation to income, indicate substantial inequality in personal propensities to make contributions. Grouping households according to the proportion of their gross income contributed makes it clear that households earning a relatively small portion of total income account for a disproportionate share of contributions. Table 2.3, based on survey data for 1973 covering itemizers and nonitemizers alike, shows that households contributing more than 20 percent of their income accounted for about 11 percent of income but over 60 percent of all contributions. At the other end, households accounting for 55 percent of income gave only 8 percent of all gifts. Table 2.4 presents similar data based on tax returns for itemizers only. It shows that there is

considerably more equality in propensities to contribute among itemizing taxpayers only than among all households. Itemizing taxpayers with 2 percent of the total income made about 21 percent of all contributions for this group. At the lower end, taxpayers with 62 percent of income gave only about 17 percent of all gifts. There is, then, considerable variation

Table 2.3 Distribution of Contributions and Income, 1973

Contributions as Percentage of AGI[a]	Unweighted Number of Households	Weighted Cumulative Distribution	
		Income	Contributions
0	154	1.3	0
0–2	1,043	39.7	3.7
2–4	455	55.3	8.2
4–6	235	65.1	12.9
6–8	106	73.4	19.1
8–10	119	79.2	24.4
10–15	120	86.8	34.6
15–20	52	89.3	39.2
20–30	36	93.1	49.0
30–50	24	94.9	55.9
Greater than 50	49	100.0	100.0
TOTAL	2,393		

Source: Tabulations from the National Study of Philanthropy. See Morgan, Dye, and Hybels 1977 for a description of this data set.
Note: Intervals include the upper limit.

Table 2.4 Distribution of Contributions and Income, Itemizers Only, 1983

Contributions as Percentage of AGI	Cumulative Distribution		
	Returns	Adjusted Gross Income	Contributions
0	12.5	6.2	0.0
0–2	62.6	61.9	16.7
2–4	80.8	81.0	34.1
4–6	87.2	87.7	44.9
6–8	91.2	91.6	53.7
8–10	93.7	93.9	60.5
10–15	97.0	96.9	72.4
15–20	98.1	98.0	78.7
20–30	99.1	99.0	86.1
30–50	99.8	99.8	96.0
Greater than 50	100.0	100.0	100.0

Source: Unpublished tabulations, based on 1983 tax model, Office of Tax Analysis, 10 December 1984.
Note: Intervals include the lower limit.

among households in propensities to contribute, and this is much more so among all households than among those who itemize their deductions.

2.1.1 Contributions by Type of Recipient

The organizations to which individuals contribute include churches and other religious groups, schools and colleges, hospitals and health organizations, community-welfare organizations, combined appeals, and other causes and organizations. Table 2.5 presents information regarding the distribution of individual gifts based on three different sources of data—a tabulation of itemized tax returns in 1962 and household surveys covering 1973 and 1978. The most apparent fact is that contributions to religious organizations account for the largest share of individual giving, over 60 percent in each case. The distribution of nonreligious gifts, however, either is more variable or information on it is less certain, or both. Giving to seemingly well-defined groups as education and hospitals appears to vary markedly, suggesting either some change in giving patterns or noncomparabilities between data sources. Giving to education exceeds 9 percent of the total in the 1973 and 1978 surveys but is only 3.6 percent among itemizers in 1962. By the same token, gifts to hospitals appear to have had a relative increase between 1962 and 1978. To what extent these

Table 2.5 **Percentage of Total Contributions by Type of Organization: Comparison of Three Data Sources**

Type of Organization	Itemized Tax Returns 1962 (1)	National Study of Philanthropy 1973 (2)	Gallup Survey 1978 (3)
Religious	60.9	62.2	66.8
Education	3.6	9.5	9.8
Higher	—[a]	6.8	—
Other	—	2.7	—
Medical and health		6.8	15.1
Hospitals	1.5	—	4.5
Other health	—	—	10.6
Other charitable	14.2		—
Culture	—	2.7	—
Combined appeals	—	8.1	—
Other	19.8	10.8	7.0
TOTAL	100.0	100.1	98.7[b]

Sources: Col. (1), U.S. Internal Revenue Service, *Statistics of Income—1962, Individual Income Tax Returns* 1964, p. 6, table E; Morgan, Dye, and Hybels 1977, p. 208, table 38 (percentages exclude unidentified gifts); Gallup Omnibus 1979, p. 8.

[a]No data given for category.

[b]Total does not equal sum of classes; possibly due to rounding.

differences are due to differences in methods of classifying gifts is unclear. Furthermore, comparisons are inhibited by differences in the categories used.[5]

The surveys do agree on the finding that the distribution of giving varies markedly by income level. Table 2.6 presents the distribution by income level based on households' four largest gifts in 1973. The proportion of gifts made to religious organizations is largest in the lower-income classes. For example, identified religious gifts accounted for 59 percent of all contributions and 88 percent of identified gifts, for those with incomes below $10,000. This pattern is similar to that of the 1962 gifts.[6] In contrast, giving to higher education grows in importance with income, accounting for 24 percent of all gifts or almost a third of identified gifts. Similarly, the importance of gifts to cultural institutions and combined appeals increases with income.

A number of writers have suggested that, in analyzing charitable contributions, it is useful to distinguish religious gifts from other contributions. Schwartz (1970a, p. 1269) refers to the inclusion of religious gifts in charitable contribution figures a "distracting element, since religious giving is not clearly philanthropic."[7] The reasoning would appear to be that a large portion of the expenditures of religious groups pays for salaries, buildings, and operating expenses for local congregations, leaving a relatively small portion for transfer outside the congregation. Needless to say, it is impossible to measure the "philanthropic" components in such diverse groups as churches, universities, or local service organizations. Some kinds of personal benefits may be derived from gifts to each, but even these benefits tend to be somewhat public and subject to "free rider" behavior.

One concrete way of describing the nature of religious giving is by examining the pattern of expenditures made by religious groups. By and large, expenditures for worship, religious education, and operation account for the bulk of religious expenditures. An estimate of "nonsacramental" expenditures—those for social welfare, health functions, and

5. Because the 1962 distribution implies contributions for education and health much smaller than those in *Giving U.S.A.*, the 1973 distribution is used in chapter 3 for simulations.

6. The proportion of gifts made to religious organizations fell from 71 percent for itemizers with incomes below $2000 in 1962 to 3 percent for those with incomes over a million dollars (U.S. Internal Revenue Service 1964, *Statistics of Income—1962, Individual Income Tax Returns,* p. 6, table E).

It is also interesting to note that a similar distributional pattern can be observed in contributions data for West Germany. Unpublished data provided by Karl-Heinz Paqué for 1974 shows that deducted contributions (other than the church tax) rose from about 0.1 percent of gross income at the lowest income levels to 0.6 percent in the highest bracket. Since these contributions probably include little if any religious giving, these figures suggest a strong income effect for nonreligious giving similar to that found in U.S. data.

7. See also Taussig 1967 and Vickrey 1962.

Table 2.6 **Contributions by Type of Organization and Income, 1973 (percentage)**

Income	Religion	Education		Combined Appeals	Medical and Health	Culture	Other Major	Not Identified[a]	Total
		Higher	Other						
$0–9,999	59	1	0	2	3	0	2	33	100
$10,000–19,999	67	1	0	3	3	0	4	22	100
$20,000–29,999	59	2	1	5	4	0	10	19	100
$30,000–49,999	42	5	7	6	3	3	6	28	100
$50,000–99,999	16	9	1	10	11	4	19	30	100
$100,000–199,999	10	14	5	9	10	5	6	41	100
$200,000–499,999	8	27	6	10	11	6	8	24	100
$500,000 or more	9	24	3	6	6	9	16	27	100
TOTAL	46	5	2	6	5	2	8	26	100

Source: Morgan, Dye, and Hybels 1977, p. 208, table 38.

[a]Information regarding donees was obtained only for the four major gifts of each donor; therefore additional giving could not be allocated to donee categories.

nonreligious education—amounted to about 18 percent of total revenues for major religious groups in 1972. A survey of 178 local churches in 1972 showed that 79 percent of total expenditures covered operating costs and another 10 percent paid for buildings and capital improvements. Only 11 percent of total expenditures went to cover special-purpose or restricted uses (Interfaith Research Committee 1977, p. 402). However, these figures may understate the amount of redistributional giving to the extent that they omit special offerings. Despite this possible bias as well as the lack of more specific categories, the available data do suggest that sacramental functions account for a preponderance of church expenditures and that a relatively small part of religious spending is redistributional in nature.[8]

2.2 The Tax Treatment of Individual Contributions

The distinctive feature of U.S. tax treatment of charitable contributions is the deduction allowed for taxpayers who itemize their deductions. Besides the general tax-exempt status of nonprofit organizations itself, the income tax deduction is probably the most important single tax policy affecting the vitality of the nonprofit sector in the United States. By reducing taxable income and thus tax liability, the deduction has the effect of lowering the net cost of making donations. It was adopted in 1917, four years after the enactment of the first personal income tax, and was available to all of the relatively limited number of Americans who paid income taxes through the 1920s and early 1930s.

2.2.1 The Standard Deduction

As the income tax expanded its coverage and raised its rates, however, a standard deduction was introduced in 1944 along with payroll deductions in an effort to achieve high compliance with a minimum of administration. Many low- and middle-income taxpayers elected this standard deduction, leaving only a portion of the taxpaying public eligible to deduct their contributions. Table 2.7 traces the proportion of taxpayers who itemized their deductions for selected years between 1945 and 1980. The table also gives the maximum standard deduction allowed a married couple. As one would expect, the proportion of taxpayers who find it advantageous to itemize deductions has risen as the real value of the standard deduction has fallen. Because of its effect on the number of taxpayers who can itemize their contributions, the standard deduction has been

8. Even a socially active church like the Riverside Church in New York devoted only about 19 percent of its budget to benevolences in 1949 (Andrews 1950, p. 174), though these budget figures probably omit some special offerings earmarked for redistributional purposes. For a discussion of the redistributional character of religious expenditures, see Schaefer 1968, pp. 29–30.

Table 2.7 Itemization and the Standard Deduction in Selection Years, 1945–80

Year	Proportion of Tax Returns with Itemized Deductions	Maximum Standard Deduction[a] for a Joint Return	
		Current Dollars	1972 Dollars
1945	17.0	$ 500	$1319
1948	16.4	1000	1888
1950	18.8	1000	1867
1952	22.1	1000	1726
1954	27.1	1000	1679
1956	31.4	1000	1593
1958	35.5	1000	1514
1960	39.7	1000	1455
1962	42.5	1000	1416
1964	41.4	1000	1374
1966	40.9	1000	1303
1968	43.7	1000	1212
1970	47.9	1000	1093
1972	35.0	2000	2000
1974	35.7	2000	1738
1976	30.8	2800	2115
1978	28.7	3400	2260
1980	31.0	3400	1897

Source: U.S. Internal Revenue Service, *Statistics of Income, Individual Income Tax Returns,* various years.

[a]Beginning in 1977, the standard deduction was made a fixed amount and renamed the "zero bracket amount."

viewed as "a threat to the continued existence of private non-profit activity" (Kahn 1960, p. 46). In response to this concern, Congress included in the Economic Recovery Act of 1981 a provision that would gradually phase in an "above-the-line" charitable deduction applicable to nonitemizers as well as itemizers.[9] If it is continued beyond its present expiration date of 1986, this extension of the charitable deduction would represent a substantial change in tax policy towards the nonprofit sector to the extent that itemization is an important influence on the level of contributions.

2.2.2 Other Limitations on Deductibility of Contributions

Congress has imposed two basic kinds of limitations, besides the standard deduction, on the deductibility of contributions: limits on the amount that can be deducted and restrictions on what kinds of organiza-

9. In 1982 and 1983, 25 percent of the first $100 of contributions was to be deductible for nonitemizers. The amount was to increase to 25 percent of the first $300 in 1984, 50 percent without limit in 1985, and all contributions in 1986.

tions are qualified to receive tax-deductible gifts. Presently, individuals may deduct contributions up to 50 percent of their adjusted gross income, although gifts to certain organizations must not exceed 20 percent. The limit was originally 15 percent of taxable income for gifts to all charitable organizations, then was expanded for virtually all taxpayers to 15 percent of adjusted gross income in 1944, to 20 percent in 1952, and to 30 percent for certain charities in 1954 (Liles and Blum 1975, pp. 25, 30–31).[10] The present maximum of 50 percent was adopted in 1969.[11] Charities for which the 50 percent limitation applies include all churches, public charities, educational institutions, government agencies, and certain private foundations.[12] The 20 percent limit applies to all other charitable organizations, including most private foundations. Contributions to the first group of charities that exceed the 50 percent limit may be carried forward as deductions for five years, but no carry-over is allowed for contributions over the 20 percent limit applying to other charities.

Table 2.8 presents information on the charitable deduction by income class for 1980. Both marginal tax rate and giving rise with income. Over 90 percent of itemizers make some charitable contribution, with the proportion rising above 95 percent among taxpayers with incomes over $30,000. Only 0.2 percent of itemizers reached the limit on deductibility, and the value of gifts exceeding the limit was 6 percent of deductible contributions. The limit on contributions was most often exceeded in the highest income classes, with more than 4 percent of taxpayers with incomes over $500,000 reaching the limit. These nondeductible gifts exceeded 20 percent of giving in each of the three highest income categories. The table also suggests, however, that the usage of the carry-over allowed for such deductions over the limit roughly corresponds to the incidence of nondeductible contributions. This suggests that virtually all qualified contributions are deductible either in the year made or in the years immediately following.

Integrated with the questions of which gifts are deductible and what limit applies is the tax code's specification of the kinds of organizations eligible to receive deductible gifts. To begin with, gifts to individuals, no matter how sincere the altruistic motive, are not deductible. Only donations to certain nonprofit organizations are eligible to be deducted. Ever since the deduction was originally enacted, the list of qualifying organiza-

10. A special provision enacted in 1924 for the benefit of an heirness-nun allowed an unlimited deduction for taxpayers who had contributed over 90 percent of their incomes in each of the previous 10 years. This provision was relaxed somewhat in 1954 to require such giving in 8 of the last 10 years and was phased out in 1974 by the Tax Reform Act of 1969 (Liles and Blum 1975, pp. 26, 32; Goode 1976, p. 161n.).

11. Tax Reform Act of 1969 (*Internal Revenue Acts* 1971, pp. 301–2).

12. These foundations include "operating" foundations and foundations designed primarily as a temporary conduit for contributions. See Arthur Andersen and Company 1982, p. 3.

Table 2.8 **Income, Tax Rates, and Contributions by Itemizers, 1980**

Income	Average Income	Marginal Tax Rate[a]	Average Contributions	Percentage of Itemized Returns			Percentage of Contributions	
				With Charitable Deductions	Exceeding Contributions Limit	With Carryovers	In Cash	Not Deductible
Under $5,000	3,030	0	173	43.5	1.7	0.5	94.3	21.6
$5,000–10,000	7,820	0	436	78.1	0.9	0.8	93.5	4.4
$10,000–15,000	12,663	0.16	513	88.1	0.2	0.2	92.7	7.6
$15,000–20,000	17,636	0.21	523	89.6	0.0[b]	0.0[b]	94.6	0.3
$20,000–25,000	22,563	0.24	565	91.9	0.1	0.8	92.4	3.0
$25,000–30,000	27,491	0.28	624	93.7	0.0[b]	0.0[b]	93.1	0.9
$30,000–50,000	37,461	0.32	858	95.8	0.1	0.1	90.6	0.9
$50,000–100,000	64,770	0.49	1,725	96.8	0.1	0.1	84.3	2.5
$100,000–200,000	132,294	0.59	4,531	97.1	1.0	1.0	69.5	19.6
$200,000–500,000	282,571	0.70	13,449	97.4	2.0	2.0	50.5	27.5
$500,000–1,000,000	667,516	0.70	46,402	97.8	4.2	5.7	43.7	38.4
$1,000,000 +	2,085,475	0.70	202,547	97.8	5.5	5.5	40.0	21.0
TOTAL				91.9	0.2	0.3	83.8	6.1

Source: U.S. Internal Revenue Service, *Statistics of Income—1980, Individual Income Tax Returns* 1982, pp. 56–57, table 2.1.
Note: Ranges include the lower limit.
[a]Marginal tax rate computed using class averages for married taxpayers filing jointly.
[b]Less than 0.05.

tions has included religious, charitable, educational, literary, and scientific organizations. In addition, this list has been expanded periodically, to include such organizations as medical research groups, state university endowment funds, governmental units, and "publicly supported" nonprofit organizations (Liles and Blum 1975, pp. 34–35). Amendments in 1918 and 1934 have stipulated that they must be domestic organizations and not be engaged in lobbying (pp. 25–26).[13] The limit of 50 percent of income applies to such organizations as universities, hospitals, community chests, charitable groups, and churches. Examples of organizations for whom gifts are subject only to the 20 percent limit are veterans' organizations and private foundations.[14]

Gifts of property are generally deductible at cost or at full market value, depending on the type of asset. Donated property may include such items as used clothes and household items, art objects, real estate, or financial assets. For most gifts of property with long-term capital gains made to charities qualifying for the 50 percent limit, no tax is levied on the capital gains. Combined with the full deduction of the market value, this provision creates an added incentive to contribute assets with large, accrued capital gains. Consider a taxpayer in the 50 percent tax bracket with a $10,000 stock holding that he originally purchased for $5000. Assuming a 40 percent inclusion rate for long-term capital gains, two options among those open to this taxpayer are (1) to increase his disposable income by $9000 ($10,000 – (0.5)(0.4)$5000) by selling the stock and (2) to contribute the stock, receiving a $5000 tax reduction from the deduction. When compared to the option of selling the stock and consuming the proceeds, the amount of consumption foregone due to contributing the stock is $9000 less the tax reduction of $5000, or $4000. In contrast a $10,000 gift of cash would reduce consumption opportunities by $5000.

There are several limitations to the general treatment described here as well as a host of possible forms in which various assets may be given. First, gifts to organizations qualifying for the 50 percent limit cannot exceed 30 percent of income in the form of property.[15] Second, deductions for donations of property subject to capital gains taxation made to private foundations or other "20 percent-type organizations" or donations of "tangible personal property" unrelated to the recipient organizations' tax-exempt functions are reduced by 40 percent of the amount that would have been taxed as long-term capital gain had the asset been sold. In addition, gifts of inventory, assets subject to short-term capital gains, and items produced by oneself are not generally deductible at their full fair

13. See also Goode 1976, pp. 160–61.

14. See Goode 1976, p. 165, and *Internal Revenue Code* 1982, sec. 170(b). See chap. 7 for a discussion of the legal definition of a private foundation.

15. The 50 percent limitation applies only if the deduction is reduced by 40 percent of appreciation. See *Internal Revenue Code* 1982, sec. 170(b)(1)(c) and 170(e)(1)(B).

market value (Goode 1976, p. 167, 167n; *Internal Revenue Code* 1982, sec. 170(e)(3)). Before 1969 donors in high tax brackets could usually contribute an appreciated asset at even lower net cost—and sometimes make a profit—by selling the asset at cost and taking a deduction for the appreciated portion. The treatment of such "bargain sales" was tightened in 1969, however, by requiring the taxpayer to include a portion of the gain in taxable income.[16]

Finally, gifts may be made through trusts or trustlike arrangements. A trust establishes an endowment, a specified combination of income and remainder payments from that endowment, and a trustee to administer the fund. Similar arrangements can be set up with universities or other charitable organizations in which the organization administers the fund. The tax consequences are the same. One form of trust is a charitable trust, which distributes both income and remainder interests to charity. A deduction is allowed for the present value of payments at the time the trust is established. In contrast, a split-interest trust has both charitable and noncharitable beneficiaries. It may be a charitable income (or lead) trust, which pays a fixed amount or proportion to a charitable organization, or a charitable remainder trust, which assigns income to noncharitable beneficiaries for a period, designating the remainder for a charitable organization. A charitable deduction is allowed for either type as long as the various interests are paid according to a predetermined nondiscretionary formula. For example, charitable remainder trusts qualify for a deduction if the income beneficiaries receive a fixed periodic payment (an annuity trust) or a fixed percentage of assets (a unitrust). A pooled-income arrangement, in which the noncharitable beneficiary receives income from funds invested and managed by a university or other charity, similarly qualifies.[17] Among its attractive features, a split-interest trust offers a means of providing a beneficiary with the income from an asset during his or her life while at the same time obtaining a charitable deduction and reducing the eventual estate tax base. At one time, giving through charitable income trusts also offered a way to make contributions beyond the percentage limitation for deductible gifts, but changes in the law in 1969 have severely limited this possibility for trusts of less than a ten-year dura-

16. For example, consider a taxpayer in the 60 percent bracket holding $10,000 worth of stock with a basis of $6000. Selling the stock would net $8800 after taxes. Contributing the stock to a charity would reduce taxes by $6000 (.6 x 10,000), for a net cost of $2800 compared to realization. With a bargain sale, the taxpayer sells the stock to a charity for $6000 and, under the pre-1969 rules, obtains a $4000 deduction with $2400 in tax reduction, for a total return of $8400 and a net cost of only $400. See Penick (1960, p. 117) for similar illustrations and *1980 U.S. Master Tax Guide* (1979, p. 941) for an explanation of the post-1969 law.

17. For discussions of the tax treatment in this area, see Penick 1960, pp. 118–28; Taggart 1970; Griswold and Graetz 1976, pp. 923–30; *1980 U.S. Master Tax Guide* 1979, p. 167; Sorlien and Olsen 1970, pp. 221–24; or Petska 1983, pp. 1–5.

tion.[18] Despite their variety and attractive features, trusts are used by relatively few taxpayers for making charitable gifts. In 1979 there were about 2000 charitable trusts, accounting for $56 million in contributions, and almost 14,000 split-interest trusts, corresponding to another $61 million (Petska 1983, p. 5). Together, these payments were less than one-half of 1 percent of all individual giving.

2.2.3 Tax Policy and the Deduction's Incentive Effect

In the debate over tax policy since the introduction of the income tax, the role of the charitable deduction in encouraging donations has been directly addressed on several occasions. Because of the emphasis in the present study on the impact of taxation on contributions, it is useful to note both the importance that such incentives have played in the policy debate as well as to review the prevailing opinion among tax scholars as to the deduction's incentive effect.

The Charitable Deduction, 1917

In the debate that accompanied congressional action to add the charitable deduction in 1917, proponents of the change justified the deduction in large part because of its presumed incentive effect. Senator Hollis, the sponsor of the amendment, argued that rising income tax rates would hurt contributions by reducing the "surplus" out of which gifts are made: "we impose these very heavy taxes on incomes, [and] that will be the first place where these very wealthy men will be tempted to economize, namely, in donations to charity" (*Congressional Record,* 7 September 1917, p. 6728).[19] That the tax effect would primarily be felt at higher incomes follows from the limited coverage of the early income tax. The bill passed in 1917, for example, levied no tax on net incomes below $37,700 in 1982 dollars and applied tax rates as high as 15 percent only for net incomes above $300,000, in 1982 dollars.[20] Once the deduction was adopted, its significance apparently was not lost on nonprofit organizations. Cornell University, for example, cited the law in its endowment drive in 1919, pointing out that wealthy individuals would bear only a fraction of the cost of gifts they made (*New York Times,* 1 December 1919, p. 14).

18. See Penick (1960, p. 128) for an explanation of how the income limits could be stretched through trusts with lives as short as two years. This was possible because the present value of the charitable interest was deductible while the charitable income interest was not taxable to the taxpayer. Current law requires the taxation of such income, thus offsetting the original deduction if the marginal tax rate is constant.

19. See also Kahn (1960, p. 46) and Liles and Blum (1975, p 25) for discussions of the incentive issue in connection with the adoption of the deduction.

20. The consumer price index relative to 1972 (= 100) was: 38.4 in 1917 and 289.1 in 1982 (U.S. Bureau of the Census 1960, p. 126; U.S. Council of Economic Advisers 1983, p. 221). The 15 percent bracket in the 1917 bill began at $40,000 (*Congressional Record* 7 September 1917, p. 6727).

The Standard Deduction, 1944

The growing coverage of the income tax during World War II motivated a proposal in 1944 to introduce a standard deduction as an alternative to itemized deductions. Combined with a withholding system for wages, the standard deduction greatly simplified tax compliance for most taxpayers. The proposal brought on a storm of opposition on the basis that the incentive effect of the charitable deduction would be lost. Representative Carl Curtis stated, "This bill, when carried into effect, means that the individual who gives a portion of his hard-earned money in contributions will have the same amount of taxes withheld from his wages as if he had given nothing" (*Congressional Record,* House, 3 May 1944, p. 4029). Church and other nonprofit organizations opposed the standard-deduction proposal as written, some advocating a payroll deduction linked to employees' anticipated donations.[21] In opposition, Senator Vandenburg expressed "doubt whether many contributors in [the] lower brackets are motivated in their philanthropy by tax-reduction aims" (*Congressional Record,* Senate, 19 May 1944, p. 4706). In the end, the Congressional debate came down to weighing the costs of reduced incentives against the simplification the standard deduction would bring about.[22]

The Charitable Deduction for Nonitemizers, 1981

A third issue that raised the question of the incentive effect of the charitable deduction was the proposal to allow nonitemizers to deduct their gifts in addition to those who already itemized their deductions. Proposed in 1979 as a means of counteracting the presumed effect of declines in itemization on giving, this bill was opposed by the Treasury due to the projected revenue losses involved. An important issue in the hearings was whether the increases in contributions would be more or less than those revenue losses. The Senate hearings on the bill focused on such seemingly technical questions as the size of the incentive effect at lower incomes and the lag in taxpayers' response to changes in the tax law. (U.S. Congress, Senate 1980, esp. pp. 51–69 and 217–35).

Scholarly Opinion on the Incentive Effect

Despite the arguments made for the charitable deduction and against the standard deduction, many commentators have expressed skepticism concerning the deduction's annual incentive effect. Reviewing trends in contributions in the 1920s, Syndnor Walker concluded that "the ratio between income and contributions is so consistent throughout the period as to suggest that giving is more definitely regulated by habit or tradition

21. See *New York Times,* 5 December 1943, p. 1; 4 March 1944, p. 11; 5 May 1944, p. 8; 25 May 1944, p. 19; 20 July 1944, p. 31; 16 September 1944, p. 16; and 1 December 1945.

22. For editorial support of simplification, see "To Simplify Taxes," *New York Times,* 5 May 1944, p. 18.

than by changes in income, tax rate, or any external circumstance (Kahn 1960, p. 47). Similarly, Kahn (pp. 71–72) concluded that the incentive effect of the deduction was weak because the introduction and extension of the standard deduction in 1941 and 1950 had no discernible effect on the proportion of income being contributed.

This view remained the prevalent one into the 1970s. Noting the scarcity of reliable research on the effect of the deduction up to that point, Aaron (1972, p. 211) concluded that "the numbers of charitable contributions suggest that it is inconceivable that the effect could be very large in the aggregate." Aaron was particularly dubious regarding the existence of a large incentive effect for taxpayers with incomes below $15,000 (p. 211). Likewise, Vickrey (1975, p. 157) argued that the price elasticity of contributions was below one in absolute value, stating: "there is grave doubt whether the deduction actually achieves to any detectable extent the intended function of stimulating gifts by individuals, as distinct from merely supplementing such gifts with a government contribution derived from what would otherwise have been tax revenue" (p. 153). Hood, Martin, and Osberg (1977) agreed, commenting that an elasticity greater than one in absolute value "strains credulity" (p. 661). In a 1973 survey, fewer than half of households interviewed said they thought the deduction stimulated giving. However, this proportion rose markedly with income, with over 70 percent of those with incomes over $50,000 believing that the tax deduction is a spur to giving (Morgan, Dye, and Hybels 1977, table 19).

Despite the doubt that exists about the existence and size of the income tax's effect on individual contributions, it is clear that taxpayers who itemize their deductions do contribute more than nonitemizers. As table 2.9 shows, itemizers contribute as much as twice or more what non-

Table 2.9 **Average Giving by Income and Itemization Status, 1973**

Income	Itemizers	Nonitemizers
Less than $4,000	$ 119[a]	$ 69
$4,000–7,999	215	89
$8,000–9,999	314	117
$10,000–14,999	407	201
$15,000–19,999	600	329
$20,000–29,999	800	354
$30,000–49,999	1,564	171[a]
$50,000–99,999	5,679	3,190[a]
$100,000–199,999	17,106	816[a]
$200,000–499,999	39,763	8,892[a]
$500,000 or more	71,316	5,000[a]
Overall average	$ 775	$ 140

Source: Morgan, Dye, and Hybels 1977, p. 193.
[a]Based on fewer than 25 observations.

itemizers at the same income level give. Itemizers in the $10,000 to $14,999 income class, for example, gave an average of $407, compared to $201 for nonitemizers. To what extent this difference is due to a price effect, some itemization effect, or other tax considerations is a central question in empirical work on charitable contributions.

2.3 Taxation and the Theory of Charitable Behavior

Students of social behavior, economists included, have devoted considerable attention to the study of altruism and helping behavior. In apparent violation of the simple economic model of egoistic utility maximization, helping behavior is observed in charitable contributions, volunteering, disaster relief, rescues at sea, public policies of redistribution, much neighborhood crime prevention, donations of blood, and intrafamily gifts and sacrifices.[23] Obviously, the nature of this giving and helping varies from case to case. In assessing the effect of income taxation on individual charitable behavior, it is useful to begin by summarizing the major theories that have been offered to explain helping behavior in general. These theories are discussed in the context of utility maximization. The effects of tax deductibility and other tax policies on the individual's opportunity set are then discussed. Finally, the possibility that government spending may "crowd out" private giving is considered.

2.3.1 Theories of Helping and Giving

Although the lines cannot be drawn precisely, it is possible to distinguish several possible motivations for helping and giving. As shown by the survey responses summarized in table 2.10, the reasons offered for making contributions suggest various dimensions of unselfish as well as self-interested motives. For example, 44 percent of respondents mentioned "belonging" as their first or second reason for making religious gifts, while the same percentage mentioned receiving benefits from giving to higher education. In contrast, pressure was cited most often as a reason for giving to combined appeals. In trying to explain giving in theory, one useful classification (Obler 1981) distinguishes three basic motivations: altruism, reciprocity, and direct benefit.

Altruism

Altruism, behavior that has little or no observable selfishness, may be founded on sympathetic feelings for others, social norms, or individual feelings of commitment. Economists, with characteristic homeliness, de-

23. For analyses of various manifestations of helping behavior, see Bolnick 1975, 1978; Clotfelter 1980a; Douty 1972; Hochman and Rodgers 1969; Hammond 1975; Landes and Posner 1978a, 1978b; Macauley and Berkowitz 1970; and Titmuss 1971. For a thorough review of the social science literature, see Gonzalez and Tetlock, n.d.

Table 2.10 **Reasons for Giving, by Donee Organization, 1973[a]**

Type of Organization	Approve, They Need Money, Feel Obligated	Get Some Benefit	"Belongs"	Pressure, Quota	Other, DK, NA	Number of Gifts
Religious	69%	8%	44%	2%	6%	1,649
Combined	66	4	2	25	15	750
Community, other	77	21	8	3	14	480
Health	53	27	2	6	24	686
Higher education	66	44	3	2	19	441
Other education	74	29	2	0	17	133
Social welfare	77	13	2	1	16	293
Cultural	75	21	8	0	12	107
Overall averages and total	67%	13%	23%	5%	13%	4,539

Source: Morgan, Dye, and Hybels 1977, p. 204, table 34.

[a]Numbers are sums of percents of first and second mentions for each reason among those who gave $100 or more in 1973. Percentages are based on gifts to various donee organizations, not dollars of giving. The question posed was: Why did you give to this organization?

scribe the sympathy and compassion that individuals commonly feel for their fellows as a manifestation of the interdependence of individual utility functions. Thus individual A may value his own consumption X_a as well as that of his neighbor B: $U_a = (X_a, X_b)$. If the marginal utility of X_b is positive, then A's contributions to B take on the usual characteristics of the consumption of ordinary economic goods.[24] One implication of preferences of this kind is that donations will depend on the relative, not absolute, well-being of potential recipients.

Behavior in this case can be illustrated by an individual's choice between personal consumption and charitable contributions, as shown in figure 2.2. Other kinds of helping behavior are ignored. In the absence of tax deductibility, the individual's after-tax income 0_b ($= 0_a$) is divided between personal consumption and contributions as shown by the budget line *ab*. The indifference curves U_1 and U_1* illustrate two different preference sets. In both, contributions to person B is a good and the indifference curves are negatively sloped over the range shown.[25] The equilibrium for indifference curve U_1 includes both personal consumption and charitable contributions and, as drawn, satisfies the usual conditions for a utility maximum. In the absence of a tax deduction, the optimum point E_1 is the point at which the marginal rate of substitution between contributions and own consumption is equal to one. In contrast, the marginal rate of substitution of U_1* is less than one, resulting in a corner solution of no contributions, despite the fact that contributions have positive marginal utility. The fact that about 16 percent of all households contributed nei-

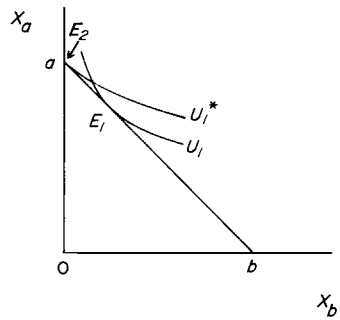


Fig. 2.2 Alternative preference sets for own consumption (X_a) and consumption of another (X_b).

24. A may value B's utility, income, or particular consumption components. For an analysis of the implications of interdependent utilities, see Hochman and Rodgers 1969. For an application to charitable contributions, see Schwartz 1970a.

25. The marginal utility of contributions may fall to zero as B becomes better off. See Hochman and Rodgers 1969 or Throsby and Withers 1979, p. 249.

ther cash nor volunteer time in 1981 indicates that this corner solution is not uncommon (Gallup Organization 1981, p. 24).

Social norms constitute another source of altruistic behavior. Often reinforced by social pressure, norms produce behavior that is indistinguishable from that arising from interdependent utility functions. Whether such social mechanisms arise to prevent "free rider" behavior or for other reasons, it is argued that they are an important determinant of giving and other charitable behavior.[26] In the presence of norms, the act of making contributions is assumed to increase utility. Thus preferences may be described by the same kind of indifference curves as those used to illustrate charity based on interdependent variables, as shown in figure 2.2.

Sen (1977) has argued, however, that not all altruistic behavior must necessarily increase utility. Instead of explaining all giving in terms of the standard model of utility maximization, Sen distinguishes a sense of duty or commitment that may lead individuals to do things plainly not in their own best interest. Obviously, this criticism goes to the heart of economic theory itself. As such, it is a theory that can be neither analyzed in terms of the assumption of utility maximization nor utilized in assessing the likely effects of tax policy on individual giving.

Reciprocity

In contrast to altruism, reciprocal helping involves the consideration that help may be returned. Obler (1981) argues that mutual-aid associations and churches, both characterized by aid or assistance among members, have high components of reciprocal giving. The argument has been carried to the level of the social community by viewing much helping behavior as a kind of social insurance. According to this view, philanthropy and everyday helping behavior are part of an informal mutual insurance pact whereby society's fortunate compensate the less fortunate.[27] To the extent to which this is important, then, people act charitably for the same reason they buy insurance. Since this kind of giving brings the benefit of

26. An explanation of how group pressures may inspire philanthropic behavior is given by Bolnick (1975, p. 220): "assuming the existence of an organization to direct and administer a charity drive, we can expect this group to generate communications to the community at large. Depending on the status of this organizational core and the amount of norm-sending generated, there will be a tendency for members of the community to contribute. These individuals in turn will generate chains of primary group pressures, tending to induce more contributions. In addition, the members of the organizing group will each generate a chain of primary group pressures, the strength of these pressures varying with the prestige of the initiators. Through these channels of influence, much of the community will be exposed to direct and/or indirect social pressures to contribute to the charity, and will base their decisions upon the strength of thse pressures, the utility derived from giving to the particular project, and the cost of choosing to contribute." As to the effectiveness of peer pressure, Morgan, Dye, and Hybels (1977, p. 274) report that 45 percent of their sample believed that people would give more if the amount given were made public.

27. See, for example, Douty 1972; Becker 1974, p. 1084; Landes and Posner 1978b; and Hirshleifer 1978.

potential return aid, the standard economic model shown in figure 2.2 would again apply. How much giving of this sort would be forthcoming depends, of course, on the shape of the indifference curves, which in turn is a function of the importance and effectiveness of that potential aid.

Direct Benefit

Finally, helping may arise out of some more immediate or tangible benefit. Individuals may volunteer for organizations in order for their families or themselves to consume services. Thus Sunday-school teachers and soccer coaches often supervise their own children. As Olson (1971, p. 34) explains this kind of participation, "in a very small group, where each member gets a substantial portion of the total gain simply because there are few members in the group, a collective good can often be provided by the voluntary, self-interested action of the members of the group." Donors may derive more ethereal personal benefit from making contributions as well. Weisbrod (1978b, p. 34) describes the character of such benefits:

> The extent to which narrow self-interest lies behind the donations of money and time to non-profit organizations is little understood, but there can be no doubt that donors often do benefit through the making of business contacts and the receipt of favorable publicity for good deeds. Having a library, park, or college classroom building named after a donor can be viewed as reflecting philanthropy but it can also be viewed as the reward for a donation—and, hence, as a form of purchase. Even small donors frequently receive tangible and direct returns in such forms as receipts of a "free" magazine, access to organized meetings with like-minded people, or other information, goods, or services, in return for their tax-deductible "gifts," "donations," "voluntary contributions," or membership dues. The motivation of those who make these contributions are doubtless complicated.

To the extent that contributions "buy" such tangible or intangible consumer goods, contributions again fall naturally into the standard utility-maximization framework, as shown in figure 2.2. An extension of this model is called for, however, in the case that contributions actually increase own consumption over some range. For example, a proprietor's contribution to local charities may increase profits through favorable publicity. Or, individuals may gain valuable job skills from volunteer work, particularly women who may have been out of the labor market for some time.[28] In such cases it is unnecessary to postulate that donors receive any direct utility from helping others since helping is literally its own reward. Thus individuals who are indifferent about the well-being of

28. Mueller 1975 emphasizes this reason for volunteer activity. See chap. 4.

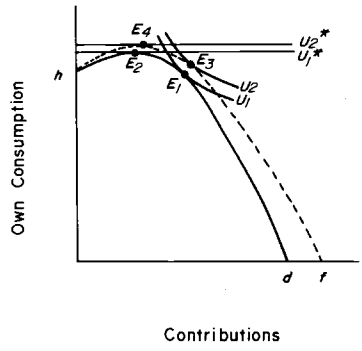


Fig. 2.3 Contributions with gains from giving.

beneficiaries will contribute or help. Figure 2.3 illustrates the choice for an individual who can gain income over some range by making contributions. The solid curve *hd* is the budget line after taxes but with no tax deductibility. Optimal contributions are positive whether the donor values making the gift itself (U_I) or is indifferent (U_I*). If contributions are deductible at a constant rate, the budget set swivels in a counterclockwise direction to *hf,* causing contributions to increase under both preference assumptions. Although such a positively sloped budget set is conceivable, the remainder of this section is confined to the analysis of the usual negatively sloped budget sets.

To sum up, helping behavior in the form of donations or charitable actions may be divided, roughly, into altruism, reciprocal helping, or strictly self-interested activity. Except for Sen's notion of commitment, this behavior can be analyzed in terms of a general utility-maximization model. Where no monetary gain is expected, helping based on interdependent utilities, norms, or personal consumption all look the same, though the underlying motivations obviously differ greatly. For the purpose of predicting individual behavior, there is little practical difference between helping others because sympathy inspires it, society expects it, or tastes demand it. In analyzing the effects of income tax treatment, therefore, individuals are simply assumed to value contributions and their own consumption as two goods and to maximize utility subject to a tax-defined budget constraint.

2.3.2 The Effect of Income Taxation

If an individual's giving behavior can be explained in a way consistent with utility maximization, the effect of income taxation on giving can be analyzed using conventional microeconomic models. The individual is seen as deriving satisfaction from contributions (G) and his own consumption of other goods (X): $U = U(X,G)$. Where gross income is Y and

taxes are a function of income and contributions ($T(Y,G)$), the maximization problem is

(1) $$\text{maximize } U(X,G),$$

(2) $$\text{subject to } Y - T(Y,G) = X + G.$$

Using primes to denote partial derivatives, the resulting equilibrium condition is

(3) $$\frac{U'(G)}{U'(X)} = 1 + T'(G).$$

Since $T'(G)$ is the rate at which taxes are reduced per dollar of contribution, equation (3) states that the marginal rate of substitution between contributions and own consumption is equal to the net-of-tax "price" of making contributions. Where contributions are a deduction in calculating taxable income, the marginal effect of contributions is the negative of the marginal tax rate, $T'(G) = -T'(Y)$, and (3) reduces to

(3′) $$\frac{U'(G)}{U'(X)} = 1 - T'(Y).$$

In order to analyze the likely effect of the tax treatment of charitable contributions, it is useful to examine in detail several existing or possible tax provisions.

Deductibility

The most important tax provision affecting charitable contributions in the United States is, of course, the deduction allowed for such gifts. Figure 2.4 shows the individual's budget lines under a progressive income tax with and without a deduction for contributions. The line *ab* is the budget set when there is no deduction, and its slope is -1, reflecting the fact that a dollar of contributions costs a full dollar in this case. The height of the budget line $0a$ is after-tax income. The line *acdef* is the budget set in the presence of a charitable deduction. The segmented nature of the budget line reflects the progressivity of the rate structure. The tax rate at which contributions are deducted will usually decline at some point as increasing contributions place the taxpayer in a lower marginal rate bracket. The slope of segment *ac* is $-(1-m_1)$, where m_1 is the marginal tax rate applying to the first dollar of contributions. The slopes of succeeding segments become steeper as the applicable marginal rate falls. If there is a ceiling on the deduction of contributions—here assumed to be point *e*—the slope becomes -1 thereafter. The optimal point shown in the figure for a taxpayer receiving a deduction is E_2, in segment *de*, corresponding to the tax rate m_3, where $m_3 < m_1$. At E_2 the marginal rate of substitution between contributions and own consumption is $(1-m_3)$.

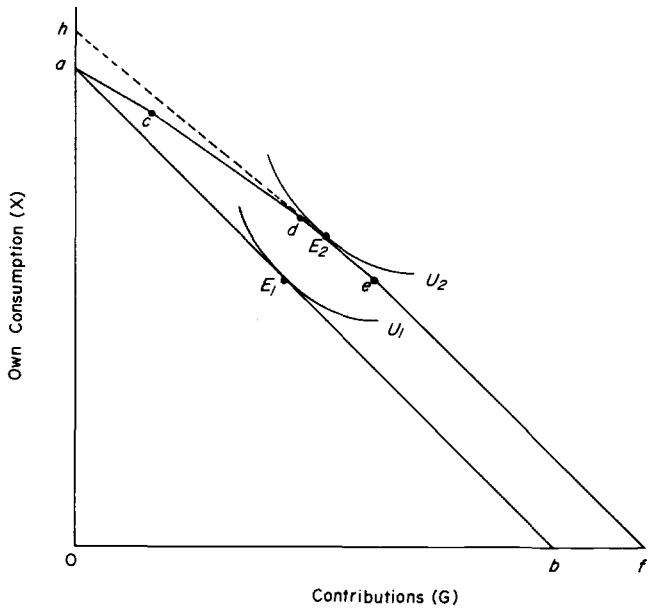


Fig. 2.4 Effect of income tax deduction for contributions.

In general, then, the deductibility of contributions has an income effect and a substitution effect. If giving is a normal good, both effects will tend to encourage contributions. If the individual chooses a point on the initial segment of the budget line (*ac*), the deduction is equivalent to a reduction in the price of contributions, and the budget line turns counterclockwise on point *a*. If another budget line is chosen, however, the progressivity of rates implies a result different from this standard effect. For example, moving from budget line *ab* to segment *de* amounts to combining two changes: (a) a price reduction from 1 to $(1 - m_2)$ and (b) an exogenous increase of *ah* in disposable income. The amount *ah* has been referred to as the "tax schedule premium," which arises from the higher rate(s) at which some inframarginal contributions were deducted from income. In estimating and predicting tax effects on giving, this additional income effect ideally should be taken into account.

In order to make the connection between the hypothetical rate schedule implied in figure 2.4 and actual income taxes, table 2.11 presents the budget set for a taxpaying household with average income in 1980. Mean values of exemptions and deductions were chosen for the income class corresponding to mean adjusted gross income (AGI) in 1980 ($37,461). Since budget lines will generally be different for each household, the case presented can only be illustrative. Maximum own consumption for this

Table 2.11 **Budget Line Segments for Average Itemizing Household, 1980 (adjusted gross income = $37,461)**

Contribution Range	Tax Liability at Lower Contribution Level[a]	Net Income Less Contributions at Lower Contribution Level	Price of Giving in Range[b]	Tax Schedule Premium[c]	
				Total	As Percentage of 31,055[d]
$ 0 -554	$6406	$31,055	0.63[e]	$ 0	1
555 -5,854	6201	30,705	0.68	28	0.1
5,855 -10,254	4505	27,101	0.72	527	1.7
10,255 -14,454	3273	23,933	0.76	1333	4.3
14,455 -18,554	2265	20,741	0.79	2313	7.4
18,555 -18,730	1404	17,502	0.82	3526	11.4
18,731[f]-36,094	1367	17,363	1.00	6930	22.3

Note: Calculations based on joint return in 1980 with AGI of $37,461. Average figures for the $30,000-50,000 AGI class were also used: excess itemized deductions—$4564; contributions—$858; exemptions—$3300.

[a]Taxable income is AGI − (exemptions) − (lower contribution level) − (other excess itemized deductions).

[b]One minus marginal tax rate in range.

[c]The tax schedule premium is the difference between first-dollar net income and the hypothetical net income implied by extrapolating the appropriate budget segment. Where P_i is .63, P_j = price applying to a given segment, and G_j is the minimum contribution level for a segment, the premium is $G_j(P_j - P_i)$.

[d]First-dollar net income.

[e]First-dollar price of giving.

[f]Fifty percent limitation on deduction as percent of AGI is assumed to apply.

household (corresponding to $0a$ in figure 2.4) is $31,055, and the price of initial gifts (the "first-dollar" price) is 0.63. Since no contributions over half of AGI are deductible,[29] the price of giving becomes 1.0 beyond gifts of $18,731. If this hypothetical household gave the average amount for the $30,000–50,000 class, $858, the table shows that the second budget segment, corresponding to a price of 0.68, would be chosen. In this case, the extra-income effect due to the tax schedule premium is $28, or 0.1 percent of beginning net income. For this premium to amount to as much as 4 percent of net income, contributions would have had to be about 12 times the actual average for the class. On the other hand, if other deductions had been about $500 more, or $300 less, the average gift of $858 would have been located on the initial budget segment. Despite the theoretical nonlinearity of tax-defined budget sets, therefore, the figures in this table suggest that the average household in practice faces a nearly linear budget set and that the effect of tax deductibility is quite close to that of a simple price decrease.

Within the general utility-maximization framework used here, it is possible to identify particular preferences that yield special cases of the effect of tax deductibility on giving. One interesting special case is that of the "target giver." If the target is stated in terms of gross contributions, the individual's giving will not be affected by income or price changes. Alternatively, the target may be stated in terms of contributions net of subsidy, or "sacrifice." As Feldstein and Lindsey (1981, pp. 21–22) note, a target level of sacrifice implies that decreases in price will lead to equi-proportional increases in gross contributions, resulting in the same behavior as would be observed for an individual with a unitary price elasticity.

Changes in Tax Rates

Although not explicitly a policy directed toward charitable giving, changes in the tax rate schedule will generally have an effect on the individual's choice between giving and own consumption. Such tax rate changes may arise from tax legislation or from inflationary "bracket creep." To illustrate the effect of a tax rate change, consider a proportional increase in all tax brackets. The result of this tax increase would be to shift the budget set toward the origin and to make it steeper. In other words, there would be an income effect discouraging contributions (if giving is a normal good) and a substitution effect encouraging contributions. The net effect of a given tax increase would depend on the size of the income and price elasticities and on the nature of the tax cut itself.[30]

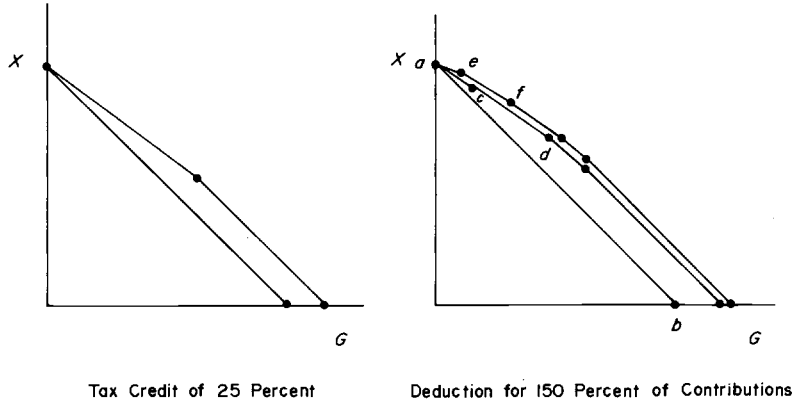
29. The 50 percent limit is assumed.
30. For further discussion of these effects, see Schwartz 1970a, p. 1272.

Tax Credit

One logical alternative to a charitable deduction is a tax credit—a reduction in taxes by some proportion of charitable contributions. While the price of giving under a deduction depends on the taxpayer's marginal tax rate, under a credit all taxpayers would face the same price of giving. With a tax credit of $100n$ percent for contributions, taxes would be $T = f(Y) - nG$ where $f(Y)$ is the tax function, and the price of giving in equation (3) would be $1 - n$. Figure 2.5 illustrates the effect of a tax credit by showing a credit of 25 percent ($n = 0.25$). Such a credit has the same effect as a price subsidy, with both the income and substitution effects leading to more contributions when giving is a normal good. As can be seen by comparing figures 2.4 and 2.5, a tax credit at rate n will have precisely the same effect on giving (cash gifts) as a deduction for a taxpayer whose marginal tax rate is n if the equilibrium occurs in the budget set's first segment. Otherwise, the deduction will have a larger income effect by virtue of the rate "progression premium," although this difference may be quite small. If a tax credit were substituted for the present deduction, however, the prices faced by most taxpayers would change since there would likely be a single tax-credit rate n for all taxpayers. The price of giving for taxpayers with marginal tax rates above that rate would increase, and the price for taxpayers with low tax rates would fall. Since both the size of gifts and the intended beneficiaries tend to vary by the income of donors, a tax credit is likely to result in markedly different size and distribution of total contributions, a possibility considered in more detail in chapter 3.

Multiple Deduction

Another alternative to a simple charitable deduction is a deduction for some multiple of contributions. While this multiple could in principle be



Tax Credit of 25 Percent Deduction for 150 Percent of Contributions

Figs. 2.5 and 2.6 Effect of tax credit and multiplied deduction in contributions.

less than 100 percent, proposals to alter this proportion, such as that made by the Commission on Private Philanthropy and Public Needs, have focused on increasing the deduction percentage beyond 100.[31] Figure 2.6 illustrates the effect of a multiple deduction by showing how a deduction of 150 percent affects the budget set. This provision pushes the budget set out from *acd* to *aef*. The initial price of giving falls from $(1 - m_I)$ to $(1 - rm_I)$, where r is the deduction rate (in this case, 1.5) and m_I is the taxpayer's marginal tax rate applicable to the first dollar of contributions. For any given deduction rate r, the higher the taxpayer's marginal tax rate, the greater the percentage point decrease in the price of giving.

One special case of the multiple deduction arises in connection with gifts of appreciated property. As Schwartz (1970a) first pointed out, the fact that capital gains on donated assets are generally not taxable reduces the price on such gifts from $(1 - m)$ to $(1 - m - m_c g)$, where m_c is the marginal tax rate on capital gains and g is the gain-to-value ratio. If u is the portion of long-term gains included in taxable income, the price is $(1 - m(1 + ug))$. This tax treatment is equivalent to a multiple deduction of cash proceeds of $100(1 - ug)$ percent.

Deduction Floor

A special case of the charitable deduction is a deduction allowed only for contributions over some minimum amount or floor.[32] This floor might be an absolute dollar amount or might be calculated as some percentage of gross income. Proposals for deduction floors have been supported as ways to maintain incentives to give while reducing the revenue cost of the deduction. The existence of a standard deduction may also act as a deduction floor for some taxpayers. Whether the standard deduction is a constant amount or is calculated as a percentage of income, it is advantageous to taxpayers to choose the standard deduction as long as itemized deductions are less. A taxpayer whose potential itemized deductions other than contributions are $100 less than the standard deduction effectively receives no deduction for his first $100 of contributions. There is an effective floor of $100: only when contributions exceed that amount will tax liability be reduced. For taxpayers facing either type of deduction floor, the price of giving is 1 initially; then it falls when the floor is exceeded.

The budget set for an individual confronting a deduction floor is shown as *abd* in figure 2.7. The budget set without the deduction is *abc*, and the floor is e dollars of giving. Along the segment *ab* the price of giving is 1, but it falls to $(1 - m_I)$ in the first segment to the right of *b*, where m_I is the applicable marginal tax rate. Unlike the budget set applying to the unlim-

31. See Commission on Private Philanthropy and Public Needs 1977, p. 4. For discussions of the multiple deduction, see Hood, Martin, and Osberg 1977 or Throsby and Withers 1979.

32. A floor has an analogous effect for a tax credit.

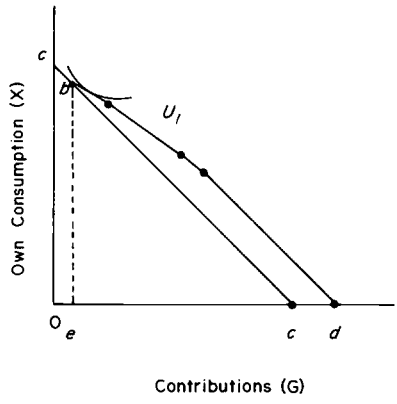


Fig. 2.7 Effect of tax deduction with floor on contributions.

ited deduction, the budget set in this case is no longer convex from above. As suggested by the hypothetical indifference curve U_1, discontinuous jumps in desired contributions could occur with very small changes in the tax rate, net income, or the floor amount.

The analysis of giving with a deduction floor raises two important issues—one econometric and one behavioral. First, the effective floor created by the standard deduction creates a class of taxpayers who become itemizers only by virtue of their charitable gifts. For such "borderline" itemizers, the price of giving the first dollar of contributions is one, and it is incorrect to assume that itemization status is independent of the choice about how much to give. This point is considered in section 2.4 of this chapter.

The behavioral issue raised by the case of a deduction floor is the possibility that taxpayers under such a plan might tend to "bunch" their gifts, say in alternate years, in order to obtain maximum benefit from the deduction. Clearly, this possibility points up one limitation of using a one-period model to examine contribution behavior. One way to see the implications of a floor for the pattern of giving over time is in a simple two-period model of contributions. Suppose an individual is prepared to contribute, in present value terms, S dollars net of taxes over two years and that gifts above a floor of M° dollars are deductible at rates k_1 and k_2 in the two years. Figures 2.8 and 2.9 show the two-period opportunity set for various floor levels.[33] Because only gifts over the floor receive the deduction, the maximum net gift of S in year 1 yields a gross gift of $M^\circ + (S\text{-}M^\circ)/(1\text{-}k_1)$. When the floor is relatively large, as in figure 2.8 (M_1) the opportunity set can be markedly nonconvex from above. Fur-

33. For constructing figures 2.8 and 2.9, $k_1 = k_2 = .33$ and the rate of interest is .10.

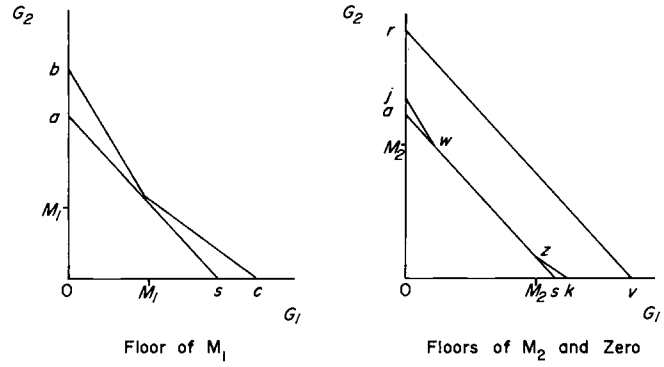


Fig. 2.8 and 2.9 Contributions with a deduction floor in a two-period model.

thermore, if there is a high degree of substitutability between gifts in either year, indifference curves will tend to be flat and bunching of gifts in one year or the other is likely to occur. In contrast, when the floor is either very high or very low, it is less likely that bunching will occur. In figure 2.9, a high floor of M_2 yields a nearly straight budget set of *jwzk*. When no floor exists, the budget set is the straight line *rv*. Whether bunching will occur thus depends on the relative size of the floor, the deduction rate, and the degree to which gifts in one year substitute for gifts in another. Although there appear to be some forces favoring relatively constant periodic gifts, at least to the extent that contributions follow involvement in organizations, it is quite conceivable that a floor could encourage alternate-year timing of gifts.[34]

2.3.3 Relative Income, Government Expenditures, and "Crowding Out"

A final question of considerable theoretical interest is how the well-being of potential recipients affects donations. If giving is motivated by interdependence in utility functions, one might predict that donations would increase as potential recipients become more needy. Two empirically testable implications follow from this reasoning. First, donors motivated by interdependence in utility functions will tend to give more as the income of recipients, relative to theirs, falls. As Becker (1974, p. 1084) states, "an increase in the incomes of both recipients and givers should not increase giving by as much as an increase in the incomes of givers alone." Accordingly, some of the empirical studies discussed in the following sections include relative income as an explanatory variable for giving.

34. For a further discussion of contributions in the presence of deduction floors, see Feldstein and Lindsey 1981 and the duscussion of simulation methods in chap. 3.

A second implication of utility interdependence, one that is directly applicable to public finance, is that government expenditures will tend to crowd out private giving to the extent that government programs make recipients better off or provide similar services to those provided through charitable organizations. How complete this effect is depends upon how closely substitutable government services are with private gifts and what exactly enters the utility functions of donors. If donors care only about recipients' income levels, a public-income maintenance program may well completely supplant private charity. If, however, donors value attributes that cannot be provided by government, or if donors value the act of giving itself, private giving is less likely to be crowded out. Rose-Ackerman (1981) suggests that government programs could even encourage private giving, depending on the difference in public and private services, the scale economies of charities, regulations imposed on charities, and the effects of increased government and on information about charities. Obler's (1981, pp. 33, 36) observations about charities in an English village are interesting in this regard. He found that only one new social-welfare charity had arisen since the rapid rise in government health and welfare programs. Over the same period, in contrast, the number of recreational and self-help groups had mushroomed, suggesting that the primary crowding out that resulted from the growth of the welfare state occurred in areas where government programs were most closely substitutable with charitable activities.

2.3.4 Conclusion

This section has reviewed alternative explanations for giving, noting that most are consistent with the standard economic model of utility maximization subject to a budget constraint. By focusing on the effects of various tax provisions on possible combinations of consumption and contributions, it is possible to show the effect of tax provisions on an individual with given income and preferences. In general, tax inducements have income and substitution effects, both of which encourage giving if giving is a normal good. It is useful, however, to summarize several assumptions implicit in this basic model. First, both labor supply and gross income are assumed to be constant. By and large, therefore, the models neither allow for the possibility that giving will increase income, nor do they make allowance for tax effects on volunteer time. Second, the model rests on the assumption that making contributions increases an individual's utility. As for contributions motivated by Sen's notion of commitment, there seems to be no direct way to adapt models based on utility maximization for the purpose of predicting the effects of income taxation on contributions. The conclusion of this section is conditioned, therefore, on the assumption that contributions, at least over some range, increase utility. Third, the basic model deals with optimization in a single period and does not consider multi-period effects of tax policies.

2.4 Econometric Studies of Contributions by Individuals: An Overview

Since 1967 there have appeared over a dozen econometric studies of charitable giving by individuals. Using different kinds of data and various model specifications, they have examined the effect on contributions of income, the income tax, and a host of other factors. This section reviews this empirical literature, focusing on the models and variables used to specify the individual's decision to contribute. Results contained in the studies are then described.

2.4.1 Model and Variables

Analogous to the specification of demand functions in consumer theory, an individual's "demand" for contributions usually takes the form

$$G = f(Y, P, Z), \tag{4}$$

where G measures contributions, Y is disposable income, P is the "price" of giving, and Z is a vector of other explanatory variables. Although the connection between utility and demand functions is seldom made explicit, it is possible to derive specific utility functions consistent with particular demand functions by utilizing the condition for utility maximization that the price of giving is equal to the marginal rate of substitution between giving and other goods.[35] In most empirical studies the demand function takes the log-linear form:

$$G = AY^aP^be^{hZ}, \tag{5}$$

where A, a, and b are constants and h is a vector of constants. For estimation purposes, (5) can be transformed by taking logarithms:

$$\ln G = \ln A + a \ln Y + b \ln P + hZ, \tag{6}$$

leaving a form that is linear in its parameters. A principal assumption implicit in the adoption of the log-linear model is, of course, that the income and price elasticities are constants. Several of the most important issues of specification in this literature come down to a question of whether this constant elasticity assumption is valid.

Contributions

The measure of contributions G is invariably based on the dollar value of gifts made. This is not surprising, since contributions are reported in dollars on tax returns and counted in dollars by recipient organizations; however, the dollar value of contributions is not necessarily an ideal mea-

35. For example, the function $U(G, Y, Z) = (1/(a+1))G^{a+1}Z^c + (1/(b+1))Y^{b+1}Z^d$ implies a first-order condition of $P = MRS = G^aY^{-b}Z^{c-d}$, or $G = P^{1/a}Y^{b/a}Z^{(d-c)/a}$, which is the log-linear form of the demand function. Diminishing marginal utility implies $a < 0$ and $b < 0$; thus the expected signs of the exponents are negative for price $(1/a)$ and positive for income (b/a).

sure of giving. It might be more desirable to measure units of final "output" provided by charitable organizations as a result of an individual's contributions. Like expenditures in education and other areas of service delivery, contributions measure the cost of inputs, not output. Neither the relative cost nor the productivity of inputs is accounted for in that dollar measure, in large part because the output of the nonprofit sector is so heterogenous and knowledge about production relationships is so limited. On the other hand, one may argue that the dollar value of contributions is the most appropriate measure of giving when individuals typically have only vague notions of how their gifts are translated into the provision of services. While some contributors may have a rough idea about the proportion of an organization's budget devoted to administration and fund raising, for example, most lack the time and expertise to assess and compare unit costs of service provision. In any case, the form in which data are available dictates that giving will be measured by the monetary value of contributions.

There are two basic sources for contributions data used in econometric studies of individual giving. The most readily available information is that based on the returns of taxpayers who itemize their deductions. Because the charitable deduction is a tax feature of long standing—and potential tax savings—it is widely utilized among itemizing taxpayers. More important, it is a deduction with relatively few constraints: for itemizers it is neither subject to a floor, like the medical deduction, nor dependent on other taxpayer characteristics, like the deductions for taxes and interest. There are, however, two principal weaknesses of the contributions data based on itemized deductions. First, no data are available for taxpayers who elect to take the standard deduction. The result is that econometric studies using tax return data are necessarily based on itemizers only. If the behavior of taxpayers who itemize is different from that of other taxpayers, the resulting estimates will, of course, not be representative of the latter. More important, equations based on samples of itemizers may be subject to sample selection bias if the decision to itemize is itself a function of contributions. This possibility is discussed below in section 2.5 of this chapter. A second potential weakness of contributions data based on tax returns is the possibility of systematic overstatement. Not only is there an incentive for taxpayers to remember "too much," the incentive to overstate gifts rises with the marginal tax rate, leading to a potential confounding of giving and cheating effects. Available data on reporting suggest that the aggregate amount of overstatement is relatively small for contributions (Clotfelter 1983b, appendix). The possibility of confounded price effects is discussed further in section 2.5 below.

The second major source of data on individual contributions is information from household surveys. Although the accuracy of survey responses may be less than information given on tax returns, surveys have the advantage of including nonitemizers as well as itemizers. One possible

bias would remain, however, if nonitemizers—because they have no reason to keep records of gifts for tax purposes—tend to underreport their giving in household surveys. There is, unfortunately, no evidence on the existence or extent of this bias, nor is there a way to test this possibility with available data. It is worth noting, however, because such differential reporting rates could provide at least a partial explanation for differences in reported giving based on itemization status.

Price

Based on the discussion above of an ideal measure of giving, the price of giving would be defined as the foregone consumption to an individual of providing a unit of output to a given recipient. To the extent that factors such as exemption from the property tax or the use of volunteer labor (or the payment of below-market wages) reduces the cost of providing such a unit, the price of giving would be reduced. In addition, the price would depend on the level of output if the "supply curve" of charitable services is upward sloping. For example, the cost of providing counseling services could rise as the number of users increases. Due to the difficulty of defining outputs and identifying relevant production functions, however, these kinds of variations in output price are ignored in defining the price of giving. In particular, the supply curve for services is assumed to be horizontal.[36]

Following Vickrey (1962) and Schwartz (1970a) virtually all of the econometric studies of contributions use as the basic measure of the price the after-tax foregone consumption per dollar of giving. In the presence of an income tax with marginal rate m, the basic price of giving is simply $(1-m)$. In practice, however, the calculation of the price can involve considerable complexity. To begin with, the federal income tax code contains a number of special features that can affect marginal tax rates. Rather than simply calculating taxable income and referring to the appropriate tax schedule, a complete calculation of marginal tax rates usually requires calculation of tax liability at two levels of contributions and then calculating the slope. Further complications arise from such special features as income averaging, the alternative tax on capital gains, the maximum tax on earned income, the minimum tax, and tax surcharges. For example, income averaging has the effect of reducing an individual's marginal tax rate below what it would otherwise be on a given amount of taxable income. Because its calculation is based on previous years' tax return data not recorded on tax files used in empirical studies, it is necessary to use iterative methods to construct the necessary information.[37] Hence, some amount of programming is required to obtain a precise measure of the marginal

36. See also Schwartz (1970a, p. 1270) for a discussion of this point.

37. Studies accounting for the effect of income averaging on marginal tax rates include Feldstein and Taylor 1976; Clotfelter 1980b; and Clotfelter and Steuerle 1981.

tax rate.[38] Such subtleties are usually forgotten, however, in studies using aggregated data. The usual approach in that case is to calculate the taxable income and corresponding marginal tax rate for the average income value in a given income class.[39]

A second complication in the calculation of the price of contributions arises in the case of gifts of appreciated assets. As Schwartz (1970a) and Feldstein (1975a) have noted, the net cost of contributing a dollar of appreciated assets, when compared to present consumption, is

$$P_a = 1 - m - m_c g, \tag{7}$$

where m is the marginal tax rate on ordinary income, m_c is the tax rate on capital gains income, and g is the asset's ratio of capital gains to market value. Where the marginal tax rate is 50 percent on ordinary income and 20 percent on capital gains and gain-to-value ratio is one-half (following the example given in section 2.2), $P_a = 0.4$, compared to a price of 0.5 for giving cash.[40] If the alternative to contributing assets is not immediate consumption, however, the price cannot be stated as simply as in (7). As Feldstein and Taylor (1976, p. 1203) discuss, the expected present value of the tax is reduced due to deferral and the possibility that the gain might never be realized and taxed as income to the individual. Thus the opportunity cost of giving an asset in the present is understated by (7) when there exists the option of holding the asset. In order to incorporate this reasoning, they modify (7) by redefining g as the gain-to-value ratio multiplied by the present value of a dollar's worth of tax payment.[41] Since there are no data on either component of this variable, Feldstein (1975a), Feldstein and Clotfelter (1976), and Feldstein and Taylor (1976) employ a maxi-

38. Two other provisions affecting marginal tax rates are worth noting: the maximum tax on earned income and the minimum tax. Under the maximum tax, taxable income is allocated to "earned" and "unearned" income, with the former facing a maximum rate of 50 percent and the latter "stacked" on top of the former. This allocation rule has the effect of reducing the top marginal tax rate below the statutory maximum of 70 percent. For further discussion of this provision, see Lindsey 1981. Chap. 3 discusses its effect on the price of contributions in 1980.

The minimum tax, imposed in several forms in recent years, attempts to ensure that some minimum amount of tax is paid by high-income taxpayers. Legislation in 1982 required taxpayers to pay the greater of the normal tax or an alternative minimum tax, calculated as 20 percent of an alternative taxable income over an exemption. Since contributions were allowed as a deduction, the price of giving for the small group of taxpayers coming under this provision was 0.80. Whether this represented an increase or decrease is unclear, however, since many of these taxpayers paid little normal tax and thus faced low marginal tax rates to begin with. See U.S. Congress, Staff of the Joint Committee on Taxation 1982, pp. 7–9; *Internal Revenue Code* 1982, sec. 55; and U.S. Congress 1982, sec. 201.

39. See, for example, Feldstein 1975a.

40. Note that the price of giving assets could be negative. Where the top marginal tax rate on ordinary income is 0.91, as it was in the 1950s, a value of g of 0.5 implies $P_a = -0.14$.

41. This could be modified to account for the possibility that no taxes will be paid by letting g be the *expected* present value.

mum-likelihood approach to select a value for g. The first two studies find that a ratio of 0.5 yields the best fit, while the third obtains both higher and lower values but assumes 0.5 for the purpose of estimation (Feldstein and Taylor 1976, pp. 1205–6).

The ambiguities of defining the price of giving assets aside, it is not obvious how that price should be used in explaining contributions. One could enter both the price of giving cash and the price of giving assets, but, as Feldstein and Taylor note (p. 1204), these measures would tend to be highly collinear. The approach adopted by Feldstein (1975a) and in subsequent studies is to form a weighted average of both prices, the weights being the proportion of gifts in cash and in asset form by income class.[42]

Because contributions are deductible in calculating state income taxes, state tax rates are another complicating feature in the calculation of the net price of giving. In 1977, thirty-two states plus the District of Columbia had income taxes providing a deduction or a credit for contributions. For taxpayers with incomes of $30,000, effective state marginal tax rates ranged as high as 14 percent (Feenberg 1982, p. 11). These rates cannot simply be added to the federal rate, however, because of the interactions between state and federal taxes. Since state taxes as well as contributions are deductible in calculating the federal income tax, the inclusion of state income taxes makes the price of giving

$$P = 1 - (m_f(1 - m_s) + m_s), \tag{8}$$

where m_f and m_s are, respectively, the applicable federal and state marginal income tax rates.[43] The only indication in the published literature as to how much difference the inclusion of state taxes makes is Feldstein and Taylor's (1976, p. 1204n) comment on the similarity of estimates for 1970 with and without them. As Feenberg emphasizes, however, state taxes provide a source of variation in net prices that is quite independent of income. This independence takes on considerable importance in assessing the statistical properties of estimated price effects in equations explaining contributions. This point is discussed in section 2.5 below.

In considering the various tax provisions that determine the net price of giving, it becomes obvious that a precise determination of the price requires individual data rich in tax information as well as data on state of residence. In the face of these interacting and sometimes complex tax provisions, one question that arises is whether individuals actually are cogni-

42. As Feldstein and Taylor point out (1976, p. 1204), using the actual breakdown between cash and noncash gifts actually made by an individual would introduce simultaneity into the definition of the price. One alternative treatment to a weighted average is Schwartz's (1970a, p. 1271) inclusion of capital gains in equations explaining contributions, but the ambiguity of this specification makes it less desirable than the weighted average.

43. See, for example, Reece 1979, p. 145.

zant of the price of giving they actually face. To test taxpayers' awareness of their marginal tax rates, Morgan, Dye, and Hybels (1977, p. 178) included a question in the Survey Research Center's National Study of Philanthropy intended to measure the marginal tax perceived by respondents. According to the authors, only 21 percent of the taxpayers in the sample gave "conceivably correct" answers, defined as rates equal to or below the maximum rate for the taxpayer's income and not lower than the minimum rate of 14 percent. Morgan, Dye, and Hybels conclude that this finding "casts doubt on the efficacy of deductibility as a major spur to charitable activity" (p. 231). For taxpayers with incomes over $30,000, however, the "conceivably correct" rate was over 43 percent (p. 178). In addition, the test for acceptable answers appears to have been quite strict. It is possible, for instance, that taxpayers' rough estimates of their marginal tax rates are unbiased, but subject to variation. While individuals may guess too high or too low, they may be correct on average. Certainly at middle and upper incomes, the source of most charitable gifts, there is considerable sophistication about taxes and tax rates.[44]

A final point relating to the calculation of the net price of giving arises from the dependence of the price on the amount that is contributed, an attribute resulting from the nonlinearity of the budget set. The approach adopted by Feldstein (1975a) and most succeeding studies was to calculate the price of giving the first dollar of contributions. Although this "first-dollar" price is clearly independent of the contributions decision, it may be a poor measure of the marginal price in some cases. As table 2.10 above suggests, however, the first-dollar price is probably a very close approximation of the marginal price in most cases. The correspondence between these two price definitions is analyzed using a sample of taxpayers in section 2.5 below.

Income

Demand theory clearly implies that income is a determinant of demand (except in the unlikely case that the income elasticity is everywhere zero), but it is often less clear how, exactly, income comes into play. In terms of the simple model presented in section 2.3, disposable income would be the appropriate measure. Accordingly, most empirical studies define income as gross income less the federal income tax. (In order to make this an exogenous measure of income, the tax is usually calculated as if no contributions were made.) The federal-tax definition of adjusted gross income (AGI) is usually used for gross income because of its easy availability, al-

44. A front-page "Tax Report" item in the *Wall Street Journal* is illustrative: "Try to delay deductions, such as charitable gifts, from years when the alternative tax will kick in to years when you will pay the regular tax" (*Wall Street Journal*, "Tax Report," 9 February 1983, p. 1).

though it is flawed by the omission of important income sources, such as excluded and unrealized capital gains and interest on state and local bonds.

Two principal alternatives to the use of disposable income are permanent income and relative income. Developed by Friedman (1957), the theory of permanent income is based on the notion that a household's consumption depends on its normal or "permanent" level of income, not on actual income received in any given year. If permanent income is the correct income measure, the use of annual income will tend to result in a downward bias in the estimated-income coefficient due to the presence of the transitory component in annual income. Several studies of charitable giving include some measure of permanent income. Feldstein and Clotfelter (1976) used a two-year average of income to represent permanent income, and Clotfelter (1980b) employed a fitted value based on trend lines fitted for each individual. In both cases, a measure of the transitory component of income was also included.[45]

The use of relative income is suggested by the theory of interdependent utility, discussed in section 2.3. For each income class in each year of his sample, Schwartz (1970a) measured own income as the average disposable income for that class and other income as the average disposable income in excluded classes. His equations were estimated with and without the other-income variable (see section 2.5 below). Reflecting much the same relative income effect, other studies have included as explanatory variables measures of the income distribution (Hochman and Rodgers 1973; Long and Settle 1979), the incidence of poverty (Dye 1978), and lower-quintile income (Reece 1979), all defined for the donor's community.

Following the simple consumer-demand model presented in section 2.3, empirical models of contributions implicitly assume that labor supply is fixed, and thus that gross income is exogenous. Menchik and Weisbrod (1981, p. 168) argue, however, that this assumption is invalid, leaving models of contributions misspecified. In order to account for the choice between work, volunteering, and other uses of time, they argue for the inclusion of the net wage in models of monetary giving. While such a general model would certainly be desirable, currently available data sets do not offer the kind of information on wages for working individuals and shadow wages for nonworking individuals necessary to estimate a complete model. Instead, one must assume that the labor-supply effects of the charitable deduction are not of sufficient magnitude to create significant bias in estimates of the income elasticity of charitable giving. This assumption does not seem unreasonable.

45. Other studies that use measures of permanent income, without a transitory component, are Schwartz 1970a and Reece 1979.

Other Variables

Besides price and income, variables have been included in models of giving in order to reflect the possible effects of personal, social, or demographic characteristics of donors. Age has been used and consistently found to be an important factor in explaining differences in personal giving propensities. Other personal variables that have been employed include marital status, wealth, education, dependents, and past giving. Community characteristics include measures of relative income and poverty, as noted above, as well as measures of government programs intended to benefit potential recipients, the idea being that government programs may reduce contributions. Like the relative-income hypothesis, the notion that public spending may crowd out private giving is an implication of interdependent utility functions.

2.4.2 Data and Estimation

Table 2.12 presents a summary of sixteen econometric analyses of charitable contributions in the United States. The studies utilize a variety of data sets, variables, and model specifications. The table gives information for each study on the data source, income limits, estimated price and income elasticities, variables other than price and income, and sample size. The elasticities shown are illustrative of basic estimates, but because these studies typically present estimates based on several different specifications, the estimates shown are not intended as a complete summary of findings.

Following at least thirty years of speculation as to the effect of the tax on giving, Taussig (1967) provided the first econometric study seeking to separate the effects of income and tax rate on giving. Using data on individual tax returns for 1962, Taussig found contributions generally to be insensitive to variations in tax rates. For income classes less than $100,000, marginal tax rates were statistically insignificant. For classes above $100,000, tax rates had a small but significant effect, implying price elasticities ranging from -0.04 to -0.10. Estimated income elasticities, on the other hand, were large and statistically greater than 1.0. As for the price effect of the income tax, Taussig's basic finding is that "the incentive effect of the deduction for charitable contributions is, in the aggregate, weak" (p. 16). This conclusion, of course, supported the speculations of Vickrey (1962) and others who had argued that any price effect on giving was bound to be small.

Taussig's conclusion has not been borne out, however, in subsequent empirical studies of taxes and giving, although much of his methodology has been adopted. Using aggregate data on contributions in several broad income categories between 1929 and 1966, Schwartz (1970a) found considerably larger price elasticities than those implied by Taussig's work. Schwartz's estimates of the price elasticity ranged from -0.41 to -0.76.

Table 2.12 **Summary of Econometric Studies of Individual Contributions**

Study	Data Source	Income Group ($ thousands)	Estimated Elasticities		Other Explanatory Variables	Sample Size
			Price	Income		
Taussig 1967	Tax file, 1962	0–25	—	1.31 (0.04)		15,400
		25–100	—	1.99 (0.05)		16,285
		100–200	−0.10[a]	3.10 (0.06)		10,450
		200–500	−0.06[a]	2.54 (0.09)		4,508
		500+	−0.04[a]	1.75 (0.12)		1,035
Schwartz 1970a	*Statistics of Income*, time series, 1929–66	0–10	−0.69 (0.49)	0.28 (0.16)	Trend, war years, pre-standard deduction years	31
		10–100	−0.76 (0.20)	0.92 (0.16)		31
		100+	−0.41 (0.10)	0.45 (0.09)		31
Feldstein 1975a	*Statistics of Income*, pooled, 1948–68	4–100	−1.24 (0.10)	0.82 (0.03)		117
Feldstein and Clotfelter 1976	Federal Reserve Board Survey, 1963	1.721+	−1.15 (0.20)	0.87 (0.14)	Age, marital status, wealth	1,406

Table 2.12 (*continued*) Summary of Econometric Studies of Individual Contributions

Study	Data Source	Income Group ($ thousands)	Estimated Elasticities		Other Explanatory Variables	Sample Size
			Price	Income		
Feldstein and Taylor 1976	Tax file, 1962	4+	−1.09 (0.03)	0.76 (0.02)	Age, marital status	13,770
	Tax file, 1970	4+	−1.28 (0.06)	0.70 (0.02)		15,291
Boskin and Feldstein 1978	National Study of Philanthropy, 1973	1–30	−2.54 (0.28)	0.69 (0.06)	Age, marital status	1,621
Dye 1978	National Study of Philanthropy, 1973	1–50	−2.25 (0.27)	0.53 (0.06)		1,780
Abrams and Schmitz 1978	*Statistics of Income*, pooled, 1948–72	4–100	−1.10 (0.08)	0.81 (0.02)	Transfers	136
Reece 1979	BLS Consumer Expenditure Survey, 1972–73	—	−1.19[b]	0.88[b]		537
Long and Settle 1979	National Study of Philanthropy, 1973	all[d]	−2.10[b]	0.23	Relative income, age, wealth, race, income distribution, AFDC, unemployment rate	1,231
Clotfelter 1980b	Seven-year panel of taxpayers (1972–73 shown)	2–50 (AGI; 1970 dollars)	long run −1.34 (0.65) short run	0.67 (0.17)	Age, marital status, dependents, lagged giving	3,456

			−0.49 (0.23)	0.24 (0.06)		
Clotfelter and Steuerle 1981	Tax file, 1975	4+	−1.27 (0.05)	0.78 (0.02)	Age, martial status, dependents	26,397
Feenberg 1982	Tax file, 1977; 10% subsample	up to 200	−1.23 (0.42)	0.44 (0.14)	Age, marital status, capital income	7,102
Reece and Zieschang 1982	BLS Consumer Expenditure Survey, 1972–73	—	−0.91	1.31	Age, education	685
Dennis, Rudney, and Wyscarver 1982	Tax file, 1979	—	−0.42	1.23		45,880
Abrams and Schmitz 1983	*Statistics of Income*, 1977, pooled by state	10+	−0.95 (0.16)	0.69 (0.06)	Transfers, poverty	357

Sources: Taussig 1967, p. 6, table 1; Schwartz 1970a, p. 1276, table 2; Feldstein 1975a, p. 37, equation 2; Feldstein and Clotfelter 1976, p. 11, equation 6; Feldstein and Taylor 1976, p. 1206, equations 2.5 and 2.4; Boskin and Feldstein 1978, p. 352, equation 1; Dye 1978, p. 313, equation 3; Abrams and Schmitz 1978, p. 35, model 3; Reece 1979, p. 146, equation 3; Long and Settle 1979, p. 14, table 2; Clotfelter 1980b, p. 333, equation 3.3; Clotfelter and Steuerle 1981, p. 425, equation 3.1; Feenberg 1982, p. 17, equation 7; Abrams and Schmitz 1983, table 2, equation 4; Reece and Zieschang 1982, p. 16; Dennis, Rudney, and Wyscarver 1982, p. 21, table 3.

Note: Numbers in parenthesis are standard errors.

[a]Schwartz 1970a, p. 1280.

[b]Elasticities calculated at means; standard errors not available or not appropriate.

[c]Taxpayers with negative disposable income deleted (Feenberg 1982, p. 16).

[d]Married households only.

The income elasticities obtained by Schwartz, ranging from 0.28 to 0.92, were also strikingly different from Taussig's high values. Feldstein (1975a) used the same aggregate tax return data used by Schwartz, but formed a pooled time-series/cross-section sample, thus increasing the variation in income and price. The resulting estimates in the basic equation were -1.24 for the price elasticity and 0.82 for the income elasticity. Three additional studies with others (Feldstein and Clotfelter 1976; Feldstein and Taylor 1976; Boskin and Feldstein 1977) using different samples of individual households yielded similarly large price elasticities (-1.15, -1.09, -1.28, and -2.54). In the latter two studies, the price elasticities were significantly greater than one in absolute value, and the income elasticities were significantly less than one.

Before reviewing other studies, it is useful to consider one policy implication of these estimates of the price elasticity. Although the magnitude of the elasticity is obviously important in determining the effect of tax incentives, there is one critical value that is of particular, if partly symbolic importance. An elasticity of -1 implies that the increased contributions received by charitable organizations as a result of the present deduction, for example, exactly offsets the loss in tax revenue to the Treasury. For price elasticities larger than one in absolute value, contributions increase by more as a result of the tax incentive than the amount of revenue the Treasury loses. This can be shown by considering a tax-revenue function such as $T = Z - sG$, where Z is the tax calculated without reference to contributions, s is the subsidy rate (equal to the marginal tax rate in the case of a deduction), and G is contributions. Holding Z constant, the change in tax revenues is.

$$dT = s\,dG - G\,ds = (P-1)\,dG + G\,dP \tag{9}$$

$$= P\,dG - dG + G\,dP, \tag{9'}$$

where the price of giving is $P = 1 - s$. If the price elasticity of giving is b, $dG\,P = b\,dP\,G$. Substituting into (9′) yields

$$dT = (1+b)\,G\,dP - dG. \tag{10}$$

It the elasticity is -1, $dT = -dG$, that is, the change in tax revenues is equal and opposite to the change in contributions. If $b < -1$, taxes will fall by less than the increase in giving brought about by a reduction in the price of giving.[46]

46. This relationship holds for subsidies arising from tax credits or multiple deductions. Because of the nonlinearity of the tax schedule, however, the relationship does not hold exactly if taxpayers drop into lower tax brackets as the result of the deduction. Nor does the simple relationship hold for deductions or credits with floors. If there is a floor of Q dollars and a subsidy rate of s, for example, the tax function becomes $T = Z - \min[s(G-Q), 0]$, reducing the revenue loss for a given price effect. This entire analysis ignores income effects.

Subsequent studies have generally tended to support the finding of the Feldstein studies that the price elasticity is at least one in absolute value. It is interesting to note that the largest estimates of the price elasticity (Boskin and Feldstein 1977: −2.54; Dye 1978: −2.25; and Long and Settle 1979: −2.10) all are based on the same data set: the National Study of Philanthropy, conducted by the Survey Research Center and the Census Department, covering contributions made in 1973. Clotfelter (1980b), Clotfelter and Steuerle (1981), Feenberg (1982), and Dennis, Rudney, and Wyscarver (1982) used data from tax files for individual itemizers, with sample sizes ranging from about 7000 to over 45,000. Employing a variety of estimating techniques, these studies found elasticities ranging from −0.42 to −1.34.[47] Much smaller samples taken from the 1972–73 Consumer Expenditure Survey, including both itemizers and nonitemizers, were analyzed by Reece (1979) and Reece and Zieschang (1982). Estimated equations explaining deductible contributions yielded elasticities of −1.19 and −0.91.[48] Finally, Abrams and Schmitz (1978; 1983) analyzed aggregate tax data on itemized contributions, obtaining price elasticities of −1.10 and −0.95. In general, econometric estimates based on analyses of aggregate tax return data appear to be less reliable, being subject to considerable variation associated with changes in sample and model specification. In particular, aggregate estimates appear to be particularly sensitive to the inclusion of low-income itemizers. Such taxpayers appear to be unrepresentative of itemizers in general due to their unusually high ratio of itemized deductions to income. As a result, studies using aggregate data have excluded low-income returns in estimation.

A number of the estimated income elasticities in the studies since 1978 fall in the 0.70 to 0.87 range found in the Feldstein studies, but several estimates are well outside of this range. Studies using disaggregated tax return data imply income elasticities ranging from a low of 0.44 (Feenberg 1982) to a set of high values obtained by Dennis, Rudney, and Wyscarver (1982), illustrated in table 2.12 by a value of 1.23 calculated at the sample means. Studies using survey data including nonitemizers imply income elasticities ranging from 0.23, in a study including relative income as well (Long and Settle 1979), to 1.31 (Reece and Zieschang 1982). Abrams and Schmitz obtained elasticities of 0.69 and 0.81 using aggregate data.

Besides price and income, the variable with the most consistent effect on contributions is age. Measured by a continuous variable or by one or more dichotomous variables, age is consistently associated with higher levels of giving. Table 2.13 summarizes results from three studies that em-

47. The latter estimate, based on equation 3.3 in Clotfelter 1980b, is the implied long-run price elasticity. The short-run elasticity corresponding to the first-year effect of a price change is -0.49. See section 2.5.1 for a discussion of this model.

48. The measure of contributions in Reece 1979, denoted *CONTRIB*, includes political contributions.

Table 2.13 **Age Effects: Giving as a Percentage of Under-35 Age Group**

Study	Data	Age		
		35–54	55–64	65+
Feldstein and Clotfelter	Survey, 1962	113	128	163
Boskin and Feldstein	Survey, 1973	158	212	236
Clotfelter	Tax returns, 1972	144	182	196

Sources: Feldstein and Clotfelter 1976, p. 8, equation 4; Boskin and Feldstein 1978, p. 352, equation 1; Clotfelter 1980b, p. 329, equation 7.

Note: Where the independent variable is the logarithm of contributions and a_i is the coefficient for a given age dummy variable, the proportional increase over the excluded group (under 35) is equal to e^{a_i}.

ployed the same age classifications. The numbers in the table express the ratio of contributions in the given class in the under-35 age group, holding constant income and other variables. The three studies imply, for example, that a taxpayer over 65 years of age will give from 63 to 136 percent more than an otherwise similar taxpayer under 35. Each of the three studies, and other studies as well, suggest that giving increases monotonically with age. Reece (1979, p. 147) estimates that the elasticity of contributions with respect to age is 0.38. There are two possible interpretations of this result: either individuals give more generously as they get older or else younger cohorts are, and will remain, less generous than their parents and grandparents were. The former seems more likely but is not proven by these findings. One other finding on age effects presented by Clotfelter (1980b) suggests that, although giving appears to increase with age, it does so at a decreasing rate. Based on changes in the real level of contributions between 1970 and 1972, taxpayers in the 35-to-54 and 55-to-64 age brackets increased their contributions only 88 percent as rapidly as those under 35, holding constant changes in income. Contributions by taxpayers over 65 increased at only 82 percent the rate of the youngest group.

Other explanatory variables have included marital status, wealth, and measures relating to the well-being of potential recipients. The estimated effects of the last of these three is presented below. Married households tend to give more than other similar households. The estimated percentage difference exhibits a large range, from 4 to 85 percent (Clotfelter 1980b, p. 329, equation 7; Feenberg 1982, p. 17, equation 7). Because of the important demographic differences between married couples and other households, some studies have restricted the sample for estimation to under-65 married households.[49] Another possible determinant of giving included in some studies is wealth. Probably the best measure is that

49. See, for example, Feenberg 1982, p. 17.

contained in the Federal Reserve Board's Survey of Financial Characteristics, used by Feldstein and Clotfelter (1976). In that study, wealth has an estimated elasticity of 0.10 (p. 11, equation 6). Dye (1978, p. 313) obtained an elasticity of 0.05 using the National Study of Philanthropy data. Using a proxy for financial wealth based on interest and dividend income, Feenberg (1982, p. 17) obtained an elasticity of 0.08. Whether these low elasticities are the result of poor measures of wealth or indications that wealth influences bequests much more than lifetime giving is unclear.

2.5 Behavioral and Econometric Issues in Empirical Studies

Because they relate to the mechanisms by which tax policy affects giving or to the usefulness of alternative econometric techniques in inferring such effects, certain issues have taken on particular importance in the econometric work on taxes and charity. This section distinguishes between issues of behavior and issues of econometrics. The distinction is necessarily artificial to some degree, however, since determination of behavioral relationships involve econometrics, and econometric issues have implications for estimated behavioral parameters. The first part discusses important behavioral questions dealt with in these empirical studies, focusing almost entirely on the mechanism by which the income tax influences individual decisions to contribute. Such behavioral questions, in effect, have to do with exactly how the model of individual giving is to be specified. The second section discusses econometric problems that arise in estimating models of taxes and giving. Although these issues arise out of the theory of statistical inference, they have important implications for estimated behavioral relationships.

2.5.1 Behavioral Issues

This section discusses six issues that focus on the mechanism by which tax policy influences contributions. By asking *how* tax policy affects giving, each essentially questions the specification of the basic econometric model of giving. In particular, each implicitly calls into question the assumption embodied in equation (5) that there is one constant price elasticity and one income elasticity.

Are Contributions to Different Types of Charities Subject to Different Influences?

Beyond the basic question of deductibility and the specification of organizations eligible for the limit based on 50 percent of income, the tax law makes no distinction regarding types of charities supported. Moreover, government data on the charitable deduction virtually never include information on the allocation of gifts by type of charitable organization. Nevertheless, the pattern of gifts by donee type is of great importance in

assessing changes in the structure of the nonprofit sector. Table 2.5 gives summary data on the pattern of giving to religion and several other major donee groups by income. The large income differences in the distribution of giving suggest the possibility that price and income effects may be different by donee type.[50]

Four empirical studies have estimated price and income effects for contributions to particular types of organizations, and their results are summarized in table 2.14. Two of the studies, by Feldstein (1975b) and Fisher (1977), rely on aggregate data for income classes and include only a few observations. Accordingly, results of these studies must be interpreted with caution. The other two studies, by Dye (1978) and Reece (1979), use survey data providing 1780 and 537 observations, respectively. While the larger sample sizes of the latter studies insure a much greater degree of statistical reliability, the surveys themselves contain relatively few high-income households; hence the estimates may not be applicable at all income levels.[51]

From the standpoint of sheer magnitude, religious gifts are the single most important category of individual contributions. The studies employing disaggregated data on religious gifts both obtained larger price elasticities (-2.15 for Dye and -1.60 for Reece) and smaller income elasticities (0.42 and 0.40, respectively) than the corresponding elasticities they obtained for aggregate contributions. The low income elasticity is not surprising, given the decline in the relative importance of religious gifts at higher incomes shown in table 2.5. The large price elasticity is unexpected, however, and appears to go against the notion that religious gifts are unaffected by tax considerations. The price elasticity obtained by Feldstein (-0.49) is quite different from these, however. Recognizing the problem posed by relying on seventeen observations, Feldstein estimated income elasticities by donee group, holding the price elasticity constant at his basic estimated value of -1.24. Under that specification, the implied income elasticity (0.38) is quite close to those obtained by Dye and Reece.

In contrast to those for religious giving, the income elasticities estimated for contributions to educational institutions are all greater than one, ranging in value from 1.22 to 2.31. The estimates of the price elasticity differ markedly, however. While Feldstein and Fisher obtained estimates exceeding two in absolute value, Reece found virtually no price response. Because Reece's sample includes few high-income households—those most likely to make substantial gifts to colleges and universities—his esti-

50. As noted by Zellner (1977, pp. 1519–20), one implication of this would be that aggregate price and income elasticities would be weighted averages of the elasticities applying to particular categories.

51. Dye 1978 excludes the few households in the National Study of Philanthropy sample with incomes over $50,000 in 1973. Reece's sample "consists almost entirely of households with annual incomes under $40,000" in 1972 and 1973 (Reece 1979, p. 149n).

Table 2.14 Price and Income Elasticities of Giving, by Selected Donee Group

Type of Organization	Estimated Elasticities	
	Price	Income
Religious organizations		
Feldstein 1975b		
Unconstrained	−0.49	0.63
	(0.08)	(0.03)
Constrained price elasticity[a]	—	0.38
		(0.03)
Dye 1978	−2.15	0.42
Reece 1979	−1.60	0.40
Educational institutions		
Feldstein 1975b		
Unconstrained	−2.23	1.22
	(0.54)	(0.19)
Constrained price elasticity[a]	—	1.54
Fisher 1977	−2.31	2.31
	(0.91)	(0.24)
Reece 1979	−0.08	1.64
Helath and welfare organizations		
Feldstein 1975b		
Unconstrained	−1.19	0.85
	(0.12)	(0.04)
Constrained price elasticity[a]	—	0.83
		(0.02)
Reece 1979[b]	−0.98	1.43

Sources: Feldstein 1975b, U.S. Internal Revenue Service, *Statistics of Income, Individual Income Tax Returns*; Fisher 1977, aggregate contributions by income class in Michigan, 1974–75; Dye 1978, p. 315, National Study of Philanthropy; and Reece 1979, Bureau of Labor Statistics Consumer Expenditure Survey, 1972–73.

Note: Sample sizes were Feldstein (17); Fisher (18); Dye (1780); and Reece (537).

[a]Price elasticity constrained to be −1.24, the value estimated in Feldstein 1975a.

[b]Includes contributions deducted from pay plus "contributions to charities such as the United Fund, Red Cross, etc., which were not deducted from pay" (Reece 1979, pp. 144–145).

mates must be interpreted with caution. Finally, Feldstein and Reece present comparable equations for contributions to health and welfare organizations. The price elasticities are reasonably close (−1.19 and −0.98, respectively), but Reece's estimate of the income elasticity (1.43) is considerably larger than Feldstein's (0.85 and 0.83).

A speculation offered by Taussig (1967, p. 19) is that contributions can be separated into two distinct categories—religious and secular—that respond differently to changes in income and price. While religious gifts are relatively unresponsive, elasticities for secular giving are larger. The findings summarized in table 2.14 provide partial support for Taussig's hypothesis. The estimated income elasticities for religious gifts are certainly

smaller than those for other categories. However, the evidence regarding the price elasticity does not, on the whole, support the notion that religious giving is less price-sensitive than giving for other purposes.

Does the Price Elasticity of Giving Vary by Income Class?

Whether taxpayers in lower and middle income classes are as responsive to tax incentives as those in the upper brackets is a question of substantial importance for tax policy and one that has received a good deal of attention. Not only are there large absolute differences in average contributions over the income scale, but also the distribution of gifts by donee classes varies by income. Since tax incentives typically differ as to their impact over the income distribution, the level and distribution of gifts resulting from each incentive are also likely to differ. This fact makes it important to know if incentive effects differ by income level. One provision of the 1981 tax act—the extension of the charitable deduction to nonitemizers—illustrates the importance of information on how the incentive effect varies by income. Because the provision applies largely to low- and middle-income taxpayers, estimates of the revenue impact and the effect on contributions depend on what the price elasticity is in the lower part of the income scale.[52]

The prevailing view among economists before 1975 appears to have been that there was little if any price sensitivity at lower incomes. According to Aaron (1972, p. 211), marginal tax rates applying to taxpayers making less than $15,000 were so low that they "cannot possibly be a major incentive to charitable giving." Taussig's (1967) study, of course, gave added weight to this notion by suggesting that tax rates had no effect on contributions by taxpayers with incomes under $100,000 (see table 2.12). As noted above, estimation problems cast doubt on these results. Other evidence by Taussig appeared to corroborate this conclusion, however. Comparing the marginal tax rates of big givers and small givers (as measured by percentage of income contributed), he showed that only in the income classes above $100,000 did big givers have higher average tax rates than small givers (Taussig, 1967, p. 10).

Schwartz's (1970a) finding of significant price effects at all income levels—with the elasticity actually falling with income—was the first evidence contradicting the general view that there was little incentive effect in the lower income classes (see table 2.12). Table 2.15 summarizes subsequent estimates of the price elasticity by income class, along with the corresponding income elasticities. All of the studies included in the table used data from tax returns for itemizers, with all but Feldstein (1975a) relying on Treasury tax files for various years. Each study uses constant elasticity equations estimated separately by income class. In the results for incomes

52. For a discussion of these issues, see U.S. Congress, Senate 1980.

Table 2.15 **Price and Income Elasticities by Income Class Based on Separately Estimated Constant Elasticity Models**

Income Class[a]	Year	Source	Estimated Elasticities[b] Price	Income
$4000–20,000	1962	[3]	−3.67 (0.45)	0.53 (0.07)
	1970	[3]	−0.35 (0.52)	0.80 (0.10)
$4000–10,000	1948–68	[2, eq. 6]	−1.80 (0.56)	0.68 (0.06)
	1975	[1]	−0.95 (0.66)	0.39 (0.21)
$10,000–20,000	1948–68	[2, eq. 7]	−1.04 (0.76)	0.85 (0.23)
	1975	[1]	−1.35 (0.32)	0.62 (0.09)
$20,000–100,000	1948–68	[2, eq. 8]	−1.13 (0.25)	0.91 (0.17)
$20,000–50,000	1962	[3]	−0.97 (0.26)	0.61 (0.19)
	1970	[3]	−0.85 (0.31)	0.89 (0.16)
	1975	[1]	−1.66 (0.11)	0.36 (0.67)
$50,000–100,000	1962	[3]	−1.10 (0.19)	1.90 (0.20)
	1970	[3]	−1.12 (0.22)	0.87 (0.20)
	1975	[1]	−1.36 (0.14)	0.67 (0.14)
$100,000 or more	1948–68	[2, eq. 9]	−0.29 (0.11)	1.38 (0.06)
	1962	[3]	−1.29 (0.04)	1.02 (0.04)
	1970	[3]	−1.74 (0.08)	1.03 (0.04)
	1975	[1]	−1.78 (0.12)	1.09 (0.05)

Sources: [1] Clotfelter and Steuerle 1981, p. 428, table 4; [2] Feldstein 1975a, pp. 89–90; [3] Feldstein and Taylor 1976, p. 1213, table 3.

[a]Income ranges for [2] are in 1967 constant dollars; other income ranges in current dollars.

[b]Standard errors in parentheses.

below $20,000 there is substantial variation in price-elasticity estimates, ranging from Feldstein and Taylor's (1976) estimate of −0.35 for their 1970 sample to −3.67 for their 1962 sample. Among the six estimates in this income class, only the largest permits rejection of the hypothesis that the elasticity is in fact greater than one in absolute value, and three are not significantly different from zero. In short, the price-elasticity estimates in this range lack precision. The main reason for this lack of precision appears to be the very small degree of variation in the prices faced by lower-income taxpayers. Incomes appear to vary more than marginal tax rates in this range, resulting in much smaller standard errors for income terms. Therefore, although the median estimate of the price elasticity for taxpayers, below $20,000 is greater than one in absolute value, these studies leave considerable uncertainty regarding the price response among lower-income households.

Among the equations estimated for the $20,000 to $50,000 income class, two of the three estimated price elasticities are less than one in absolute value, although all are significantly different from zero. The four equations covering incomes up to $100,000, however, all imply point estimates for the price elasticity that are greater than one in absolute value. In general, the standard errors of the estimated coefficients tend to decline with income level due to the increasing variation in price among taxpayers. As for the income elasticity estimates in the $20,000 to $100,000 class, five of the seven are in the range of 0.61 to 0.91.

Four sets of estimates are available in the highest income class—$100,000 and above. The three studies using disaggregated tax return data yield large price elasticities, ranging from -1.29 to -1.78, and all are significantly different from -1. The estimate based on aggregate data is quite small at -0.29, but this can be explained by the inherent lack of precision in calculating marginal tax rates for the highest income group when variations among taxpayers in deductions, type of income, and special tax provisions must be ignored. The income elasticities obtained in the three analyses of disaggregated data are remarkably similar. Even though the standard errors are quite small, none is significantly different from 1.0. These separate estimates thus suggest a profile of taxpayers at the upper end of the income scale who are quite sensitive to tax-induced changes in price and to changes in after-tax income.

Another way of allowing for variations in price responsiveness is by estimating more flexible forms of the basic giving equations, forms that allow price and income elasticities to vary by income level. Estimates using three such flexible models for 1975 tax return data are shown in table 2.16. The first is a basic log-linear equation with an interaction term added. It takes the form:

$$\ln G = A + a \ln Y + (b + c \ln Y) \ln P. \tag{14}$$

The implied price elasticity is

$$\frac{\partial \ln G}{\partial \ln P} = b + c \ln Y, \tag{15}$$

which varies with income if c is nonzero. In the equation for 1975, on which the first column is based, the estimate of c is negative, implying that the price elasticity grows larger and more negative as income rises. When calculated at the mean values for each income class, the implied elasticity rises from -0.38 in the $4,000 to 10,000 class to -1.67 for incomes over $100,000. At income levels below $3119, the implied price elasticity is positive. Feldstein and Taylor (1976, p. 1213, equation 4.1) present a similar equation with interaction term for 1970; the results also imply a price elasticity that rises with income. They reject this specification, however, because of the implication of positive price elasticities for incomes below $7455, stating that "the attempt to fix such a smooth and monotonic rela-

Table 2.16 **Income Variation in Price and Income Elasticities Implied by Single Equation Models**

Income Class and Variable	Model		
	Interaction Term[a]	Translog[b]	Constant Income Elasticity
$4,000 under 10,000			
Price	−0.38	−0.42	−2.17
	(0.07)	(0.13)	(0.27)
Income	0.55	0.55	0.72
	(0.02)	(0.05)	(0.02)
$10,000 under 20,000			
Price	−0.66	−0.73	−1.39
	(0.06)	(0.12)	(0.12)
Income	0.59	0.58	—[c]
	(0.02)	(0.04)	—
$20,000 under 50,000			
Price	−0.91	−0.97	−1.26
	(0.06)	(0.09)	(0.07)
Income	0.65	0.65	—[c]
	(0.02)	(0.03)	—
$50,000 under 100,000			
Price	−1.27	−1.25	−1.14
	(0.05)	(0.06)	(0.06)
Income	0.82	0.83	—[c]
	(0.02)	(0.05)	—
$100,000 or more			
Price	−1.67	−1.51	−1.51
	(0.56)	(0.06)	(0.06)
Income	0.90	0.91	—[c]
	(0.02)	(0.02)	—

Source: Clotfelter and Steuerle 1981, p. 428, table 4.

[a]Elasticities calculated at class means, based on the estimated equation:

$$\ln G = \underset{(0.26)}{3.39} \ln P + \underset{(0.02)}{0.48} \ln Y - \underset{(0.02)}{0.42} \ln Y \ln P + \ldots$$

[b]Elasticities calculated at class means, based on the estimated equation:

$$\ln G = \underset{(0.63)}{4.31} \ln P - \underset{(0.12)}{0.25} (\ln P)^2 + \underset{(0.27)}{0.71} \ln Y - \underset{(0.013)}{0.014} (\ln Y)^2 - \underset{(0.07)}{0.54} \ln Y \ln P + \ldots$$

[c]Single income elasticity estimated for all classes.

tion between price and income is not appropriate. In order to fit the observations well at high income levels, the functional form is forced to be inappropriate at low levels" (p. 1213). In contrast, Brittain (1981, p. 443) argues that such "varying functions of price seem entirely appropriate, given the strong relationship between P and Y."

An alternative functional form that does not constrain the price elasticity to vary smoothly with income is the translog form:

$$\ln G = a \ln Y + (b + c \ln Y + g \ln P) \ln P + h (\ln Y)^2, \tag{16}$$

where the price elasticity is

$$\frac{\partial \ln G}{\partial \ln P} = b + c \ln Y + 2g \ln P. \tag{17}$$

Elasticities based on an estimate of the translog form for 1975 are shown in table 2.15. They reveal much the same pattern as shown in model with a simple interaction term: the implied price elasticity rises in absolute value with income, although not quite as steeply. The range is from -0.42 in the lowest income group to -1.51 in the highest. The income elasticities, almost identical to the interaction model, rise from 0.55 to 0.91—from lowest to highest income class.

The third single-equation model estimated for the 1975 data assumes a constant income elasticity but allows for separate estimates of the price elasticity by income class. The single income elasticity 0.78 corresponds to other income elasticities estimated using aggregate data. The pattern of estimated price elasticities in this model is strikingly different, however, in that low-income taxpayers are shown to be most price sensitive. Price elasticities vary from -2.17 in the lowest income class to -1.51 in the highest. It is curious that all of these estimates are larger than the overall price-elasticity estimate of -1.27 obtained for the 1975 sample reported in table 2.11; there is no easy explanation for the pattern of estimates since each was allowed to vary independently.

A final single-equation model, estimated for the 1979 tax file, is Dennis, Rudney, and Wyscarver's (1982) linear expenditure form.[53] This model rejects not only the assumption that the income and price elasticities are the same for all income groups, but also the notion that they are constant at all income levels for a given individual. The model is based on the notion that utility depends on expenditures above some minimum amount in each spending category. One interpretation of the model is that the elasticities applying to "discretionary" income differ from those applying at lower income levels. Estimates imply price elasticities that rise from about -0.25 for taxpayers in the \$20,000 to \$30,000 income class to -0.98 for taxpayers making more than \$200,000. Corresponding income elasticities are 1.27 and 1.04. One apparent reason for the variation in elasticities over the income scale is the linear nature of the estimating model itself. That a linear form may be improper is strongly suggested by

53. Although the linear-expenditure model is a system in name, in practice it implies the estimation of a single equation when there are only two "goods." See Dennis, Rudney, and Wyscarver 1982, p. 10.

one implication of the estimates: utility is a function of contributions over $495 and other expenditures over $17,354.[54] Since a large proportion of taxpayers neither give the former nor make the latter, the validity of the linear form is suspect.

The evidence summarized here provides no firm conclusion regarding the important issue of variation in the price elasticity by income level. The best evidence comes from separately estimated equations, and these estimates strongly suggest that price elasticities at upper incomes are larger than one in absolute value. Estimates for income groups between $20,000 and $100,000 suggest elasticities around -1, but these estimates are subject to greater variability. For households with incomes below $20,000, the estimates based on the tax returns of itemizers provide variable and imprecise results. These estimates may be compared to those reported in table 2.12 applying largely to low- and middle-income taxpayers: -2.54 (Boskin and Feldstein 1977), -2.25 (Dye 1978), -1.19 (Reece 1979), -1.34 (Clotfelter 1980b), and -0.91 (Reece and Zieschang 1982). Differences in estimation techniques aside, this set of estimates leaves a very murky picture indeed regarding the price responsiveness of taxpayers at the lower end of the income scale. In choosing which estimate of this group to rely on, one must choose between the precise data of a self-selected group (in studies using tax data for itemizers) or the imprecise data of a randomly selected group (in surveys)—a dilemma that does not apply at income levels where most people are itemizers. Some of the associated estimation problems are discussed below in part 2.5.2. In summarizing the variation in the price elasticity by income class, Zellner's (1977, p. 1519) conclusion is apt: "Simply put, the price elasticities for different income groups have not been determined very precisely."

Is There an Independent "Itemization Effect"?

The basic model of contributions embodies the maintained assumption that a given change in the net price has the same effect whether it arises out of a change in marginal tax rate or a shift into or out of itemization status. An alternate view is that taxpayers respond quite differently to a change in itemization, compared to other changes in net price. As Dye (1978) notes, this explanation is consistent with the observation that, while many taxpayers do not know their marginal tax rates, they usually know if they itemize their deductions. Boskin and Feldstein (1977) and Dye provide tests of this possibility using the National Study of Philanthropy. Dye shows that a dummy variable for itemization status performed as well in explanatory power as the conventional price term. Among the subsample of itemizers, the price term was not significant. From this he concludes

54. The implied utility function is $U = .0275 \ln (G - 495) + .9725 \ln (X - 17{,}354)$, where G is contributions and X is other consumer expenditures. See Dennis, Rudney, and Wyscarver 1982, p. 19.

that the "price effect is really an itemization effect misspecified as a constant elasticity" (p. 313). This assessment does not account, however, for the significant price effect estimated for samples made up exclusively of itemizers.

To test for an independent itemization effect, Boskin and Feldstein (p. 354) modified the basic equation by allowing the intercept to vary between itemizers and nonitemizers. The resulting estimates are not significantly different, giving no support for the existence of an independent itemization effect. This is the strongest test of the hypothesis, but because it relies on only one data set its negative conclusion should be interpreted with caution.

Are There Lags in Adjustment in Giving Behavior?

Like other kinds of economic behavior, charitable giving may adjust incompletely to changes in price and income. Schwartz (1970a, p. 1271) notes a "possible desire on the part of donors to sustain a pattern of giving." Vickrey (1975, p. 157) observes "a tendency to establish a steady level of gross support, particularly for ongoing activities, that may persist for a considerable time in face of substantial changes in the tax incentives." And to the extent that donations are stimulated by solicitations, the intensity of which may depend on past giving, levels of donations may be relatively slow to change. Such behavior is suggested by Lamale and Clorety (1959, p. 1310), who note a tendency for retired people to give to religious organizations "at a level which reflects their giving habits before retirement." Similarly Morgan, Dye, and Hybels (1977) observe that taxpayers who had recently begun to itemize their deductions tended to give less than long-standing itemizers, as shown in table 2.17. By the same to-

Table 2.17 Ratio of Actual to Average Giving by Itemization Status

	Ratio of Actual to Average Giving in Income Class (and Age Group for Incomes over $50,000)	
Itemization Status	Unadjusted	Adjusted[a]
Never itemized	0.71	0.71
Started itemizing during last five years	0.80	0.99
Always itemized	1.42	1.37
Stopped itemizing during last five years	0.88	0.79

Source: Morgan, Dye, and Hybels 1977, p.194, table 25.

[a]Adjusted by regression for correlation with other variables.

ken, they found that taxpayers who had recently stopped itemizing gave more than taxpayers who had never itemized.

Such behavior has important implications for the dynamics of charitable giving and for the usefulness of estimated coefficients for simulating the effects of tax policies. In general, the effects of changes in tax policy will tend to be smaller in the short run than in the long run. It may not be appropriate, therefore, to apply estimates for cross-section equations in simulating the dynamic effects of tax changes.

One model that explicitly recognizes the possibility of lags in adjustment is an incomplete-adjustment model with an exponential coefficient of adjustment s:

$$G_1/G_0 = (G_1^*/G_0)^s \tag{18}$$

where G_1 and G_0 are levels of contributions in period 0 and 1 and G_1^* is the long-run level of giving, determined by income, price, and other variables:

$$G_1^* = AY^aP^be^{gx}. \tag{19}$$

A value of s less than one implies that personal giving does not adjust completely in the first period after a tax-induced change in price or net income. Only when s is close to one will long-run equations be accurate in predicting short-run changes in giving. Combining equations (18) and (19) and taking logarithms yields the estimable equation:

$$\ln G_1 = C + sa \ln Y + sb \ln P + sg X + (1-s) \ln G_0, \tag{20}$$

where C is a constant term. From this equation it is possible to infer the short-run income and price elasticities, sa and sb, as well as the long-run elasticities a and b.

Table 2.18 presents estimates based on equation (20) using panel data of U.S. taxpayers. Instrumental-variables estimation is used because of the lagged dependent variable. Two of the equations are based on a two-year adjustment period while the last is based on a one-year interval. The estimates of the adjustment coefficient imply that contributions do not adjust right away to the new long-run level as a result of changes in price and income. The coefficient of 0.609 implies, for example, that about 60 percent of the expected long-run change will occur in two years and about 84 percent in four years. Roughly the same adjustment process is implied by the one-year coefficient of 0.371. The estimated coefficients for 1968–70 and 1972–73 imply long-run price and income elasticities on the order of estimates from cross-section equations: -1.5 and -1.3 for price, respectively, and 0.7 for income. The equation for 1970–72 implies a higher income elasticity and a lower income elasticity. All of the estimates of the price elasticity in this study are subject to relatively large standard errors, however. These estimates appear to support other evidence that taxpayers

Table 2.18 **Price and Income Elasticities Based on Incomplete Adjustment Model**

Period	Short Run		Long Run[a]		Coefficient of Adjustment
	Price	Income	Price	Income	
1968–70	−0.938	0.423	−1.549	0.698	0.609
	(0.302)	(0.061)	(0.511)	(0.115)	(0.049)
1970–72	−0.241	0.466	−0.450	0.870	0.540
	(0.301)	(0.068)	(0.559)	(0.151)	(0.052)
1972–73	−0.487[b]	0.243[b]	−1.337	0.667	0.371[b]
	(0.231)	(0.055)	(0.649)	(0.173)	(0.050)

Source: Clotfelter 1980b, p. 333, table 3.

[a]Approximate long-run elasticities. See Clotfelter 1980b, p. 333, table 3.

[b]Short-run elasticities and coefficients for 1972–73 sample refer to a one-year adjustment period and are thus not strictly comparable to parameters based on a two-year time period.

do not adjust to changes in tax policy immediately, resulting in smaller effects in the short run than in the long run.

What Is the Form of the Income Effect?

Another important question regarding the specification of the model of contributions concerns the form in which income enters in the determination of giving. The simple theory of giving discussed in section 2.3 implies that an individual's income will, in general, affect contributions. Income will have a positive effect if, as is thought to be the case, giving is a normal good. As is the case in demand analysis, income is normally measured net of taxes. Several alternatives have been suggested, however, for the use of current, or annual income as the basic measure of income. They include permanent income, discretionary income, and relative income.

As noted in the discussion of variable definitions, permanent income may be defined as an average of annual incomes or as a "fitted" value based on an individual's own personal trend income. Studies that use one of these measures to compare estimates of income elasticities based on permanent and current income conclude that permanent income yields the larger elasticity. Feldstein and Clotfelter (1976, p. 9), using a two-year average of disposable income, found a permanent-income elasticity of 0.87, compared to an elasticity of 0.84 for current income. The difference is well within the associated standard error, however. Cross-section equations for 1972 presented by Clotfelter (1980b, p. 329) show a larger, though still insignificant, difference between elasticities for current disposable income and a permanent-income measure based on the trend in gross income. The elasticity for current net income is 0.53, compared to 0.61 for permanent gross income. A measure of the transitory income component, entered along with permanent income, also has a positive effect on current contributions: if current exceeds permanent income by 10 percent, the equation implies that contributions will rise by an additional 1.7 percent. The available estimates, then, do not allow one to determine whether current or permanent income is the correct income measure. Subject to the difficulties in measuring permanent income, both give similar results. The statistical significance of transitory income suggests, however, that current gifts are not wholly a function of permanent income.

Related to the notion of transitory income, a second variant for the income effect emphasizes the role of "discretionary" income. This explanation of giving implies that an individual's propensity to contribute out of discretionary income—income over that which is required or already committed for other purposes—may be quite different from the propensity to contribute out of other income. A problem in testing this theory lies, of course, in identifying which income is "discretionary." Dennis, Rudney, and Wyscarver (1982) present evidence consistent with this notion by estimating a function that allows such variation in giving propensities.

Another test of this hypothesis is provided by my analysis (Clotfelter 1980b) of changes in giving behavior over time. If increases in income are assumed largely to be increases in discretionary income, one implication of the discretionary-income hypothesis is that contributions should be more responsive to changes in income than the level of giving is to income. In three equations examining changes in contributions, I found (p. 331) elasticities associated with changes in the transitory component of income to range from 0.23 to 0.37, lower than most estimated income elasticities. In addition, the individual's trend in income has a higher elasticity than the transitory component in two of the three equations. While these estimates do not support the discretionary-income hypothesis, they represent only a rough test. In particular, the assumption that all changes in income represent changes in discretionary income is certainly open to question.

A third hypothesis regarding the effect of income is that giving depends on the income of others, including potential recipients, as well as the donor's own income. As Schwartz (1970a) shows, this hypothesis implies the inclusion either of relative income or the income of others along with own income. Where Y is own income and Y_0 is the income of others, the basic log-linear model can be written:

$$G = AY^a Y_0^c P^b. \tag{21}$$

This is equivalent to estimating

$$G = AY^{a+c}(Y/Y_0)^{-c}P^b, \tag{22}$$

where (Y/Y_0) is a measure of relative income. As Schwartz notes, however, Y and (Y/Y_0) are highly correlated, making equation (21) a preferable form for estimation. The implications of relative and absolute income effects are quite different. A general increase in incomes will increase giving if own-income is the determining factor, but would not affect giving if relative income is important. As Schwartz (1970a, p. 1274) suggests, the omission of relative income can lead to an overestimate of the own-income effect because of the correlation between the two income measures. Such omission may of course bias the estimated price effect as well. Schwartz's estimates using models with and without relative income are shown in table 2.19. Other income is measured by average disposable income for those not in the sample being examined. For each income class the estimated elasticity for own income is smaller when other income is included in the equation, which is consistent with the possibility of bias due to the omitted variable. Schwartz concludes from this that relative income is more important than own income (p. 1286), but these results seem too thin for a definitive conclusion.

Other studies have obtained mixed results with regard to the effect of relative income on contributions. In an equation with no price variable, Hochman and Rodgers (1973) found that income dispersion had a posi-

Table 2.19 **Estimated Elasticities for Price, Own Income, and Other Income, 1929–66 Aggregate Data**

	Income Class		
	$0 under 10,000	$10,000 under 100,000	$100,000 or more
Excluding other income			
Price	−0.69	−0.78[a]	−0.41[a]
Own income	+0.28	0.92[a]	0.45
Including other income			
Price	−0.85[a]	−0.79[a]	−0.38[a]
Own income	+0.19	0.76[a]	0.40[a]
Other income	−0.53[a]	−0.43	−0.38

Source: Schwartz 1970a, p. 1276.

Note: Estimates based on logarithmic specification. Other variables included trend, World War II dummy, dummy for years before standard deduction. $N = 31$.

[a]Coefficients with t-statistics greater than two in absolute value.

tive effect on the level of contributions, thus supporting the interdependent-utility hypothesis. Dye (1978) reports a positive and significant effect for the percent poor in a donor's community, also adding support for the hypothesis. Long and Settle (1979) obtained both positive and negative coefficients for their relative-income variable, and Reece (1979) found no significant effect for the lower-quintile family income. Abrams and Schmitz (1983) found that contributions in 1979 increased with the percentage of the state's population in poverty.

Schwartz argues that the omission of relative income will be more serious in cross-section data, where relative income varies greatly (but collinearly with absolute income). There is, unfortunately, no way to separate the own-income and relative-income components in most estimated income coefficients. When predicting the effects of income changes independent of changes in the incomes of others, this is of no practical importance. It is only in predicting the effects of general increases in income on giving that this distinction is relevant. If, for example, relative income is a significant component underlying income elasticities on cross-section data, such elasticities will tend to overstate the effect of secular increases in national income on giving.[55]

55. For a general discussion of the dynamic properties of cross-section estimates, see Kuh 1959, p. 212.

Does Government Spending "Crowd Out" Private Charity?

If donors are concerned ultimately about the well-being of potential recipients, donations may be affected by government programs providing aid in the same way they might respond to increases in relative income. Donors may, in short, be able to see through the "veil" of government programs to assess the need by charitable organizations for contributions. Abrams and Schmitz (1978) tested this hypothesis by adding to Feldstein's (1975a) pooled data three alternative measures of expenditures on health, education, and welfare functions. Although the coefficients are of the expected (negative) sign, the omission of a trend variable leaves open the possibility that these variables merely reflect a previously estimated negative trend effect.[56] In order to remove any trend effect from the measure of government expenditures, I estimated equations using a similar data set composed of pooled time-series and cross-section observations spanning the period 1948 to 1980.[57] The estimates are presented in table 2.20. Equation (2) is of the form used by Abrams and Schmitz, including the logarithm of per capita federal expenditures on welfare and related functions

Table 2.20 **Regressions Explaining Logarithm of Contributions, with Measure of Federal Welfare Expenditures Included**

	1	2	3
Log price	−1.656	−1.665	−1.660
	(0.090)	(0.090)	(0.090)
Log income	0.621	0.618	0.620
	(0.030)	(0.030)	(0.030)
Time trend	−0.00813		−0.00376
	(0.00136)		(0.00546)
Log of expenditures per capita		−0.0988	−0.0547
		(0.0165	(0.0661)
Intercept	−0.070	0.225	0.090
	(0.250)	(0.248)	(0.316)
R^2	.938	.938	.938

Note: The method of estimation was weighted least squares. The sample was restricted to classes with an average income of $4000 and above for the years 1948 to 1980, leaving 337 observations.

56. See Abrams and Schmitz 1978, p. 37, footnote 11, and Feldstein 1975a equation (3), p. 88.

57. A description of this sample is given in Appendix A.

but no trend. As in their study, the estimated coefficient is negative and significant. When the trend was included in addition, however, the government-expenditure variable became insignificant, making it impossible to reject the hypothesis that factors other than crowding out were responsible for the previous negative coefficient. This result casts doubt, of course, on the original Abrams and Schmitz (1978) test of crowding out. In another test, Dye (1978, p. 315) obtained insignificant and wrong-signed estimates using per capita local-government expenditures. It seems quite possible, however, that the redistributive element in local-government programs is lost in any measure of aggregate expenditures. Recently, Abrams and Schmitz (1983) have presented more convincing evidence of a crowding-out effect. Using pooled aggregate data for states, they obtained a negative effect for state-government transfer payments. As with other estimations based on aggregate data, however, these results may be sensitive to variations in sample specification and thus should be interpreted with caution.

Are Individual Giving Levels Related to Each Other?

Related to the notion of crowding out by government expenditures is the possibility that one individual's donations are affected by the donations made by others. One reason why individuals' giving decisions may be mutually dependent arises out of the same interdependence of utility functions underlying the potential effect of government programs: if donors care about recipients' well-being, contributions made by others can substitute for an individual's own giving. As in the case of government crowding out, this reasoning suggests a negative relationship between an individual's contributions and contributions by others. Another source of interdependence in giving, however, suggests an effect in the opposite direction. The example of others' giving behavior may stimulate one's own giving, either by fueling the altruistic urge or by exerting peer pressure. Furthermore, it is possible that such influences are asymmetric, with gifts by those with more income affecting those with less income, but not vice versa.

The net effect of these possible influences on the interaction of individual giving is uncertain. However, the existence of a significant interaction would have important implications for the interpretation of estimated tax effects on contributions. For example, Steinberg (1982) discusses the interpretation of estimates of the price elasticity based on cross-section data when the true model of contributions is of the form:

$$G_S = f(P, Y, G_0), \tag{23}$$

where G_S is an individual's own contributions and G_0 measures the contributions of others. The full effect of a change in price (holding income con-

stant), for example, is composed of a direct price effect and an indirect effect through the price effect on the contributions of others:

$$\frac{dG_s}{dP}\Bigg|_{dY=0} = \frac{\partial G_s}{\partial P} + \frac{\partial G_s}{\partial G_o}\frac{dG_o}{dP} \tag{24}$$

If giving by others is constant, as in a cross-section model, the estimated price effect corresponds to the partial derivative $\partial G_s/\partial P$. However, economywide changes in tax policy will affect the giving of others, and the total price effect on giving will differ from the estimated effect if $\partial G_s/\partial G_0$ is not zero. If the substitution effect of others' giving dominates and $\partial G_s/\partial G_0 < 0$, the actual price effect will be smaller in absolute value than the estimated effect. If the peer effect dominates, the actual effect will be larger in absolute value.

The most explicit examination of interactions in giving is presented by Feldstein and Clotfelter (1976). To measure the contributions of others, they added the variable

$$g_i^* = (\sum_j W_{ij} \ln \overline{G_j}) / (\sum_j W_{ij}), \tag{25}$$

where $\overline{G_j}$ is the mean giving for income class j, W_{ij} is a weight assigned to income class j depending on individual i's closeness in the income scale: $W_{ij} = (Y_i/Y_j)^{\phi}$, and the summation is carried out only for income classes at or above an individual's own class. The range of values for ϕ that minimized the residual sum of squares was 10 or more, suggesting that giving only in an individual's own income class matters. Furthermore, the coefficient of g_i^* was not significantly different from zero in an equation explaining giving by individuals. This is by no means a definitive test of the interdependence hypothesis, however, because the interactive effects of giving would be expected to be much stronger at the local level than at the national level, as these comparisons are stated.

2.5.2 Econometric Issues

Because of the policy importance of empirical estimates of models of giving, considerable attention has been devoted to the econometric techniques researchers have used. This section discusses some of the questions that have been raised concerning econometric theory and technique. Admittedly, the econometric issues discussed here have behavioral implications, just as the issues of specification discussed in part 2.5.1 have direct implications for the econometric properties of estimated models.

Identification of Price and Income Effects

Any tabulation of average contributions by income shows a strong positive relationship. Since marginal tax rates also rise with income, the positive correlation between contributions and income is a combination of an income effect and a price effect. The problem of identifying what

portion of the effect, if any, is due to the tax-defined price has been recognized by researchers for some time,[58] but not until the application of multiple-regression estimation techniques was there a reasonable prospect of disentangling the price and income effects. The problems caused by attempting to estimate the separate effects of two highly correlated variables—that is, multicollinearity—are well known. The most important result is a reduction in the precision with which either effect can be estimated, indicated by relatively large standard errors for coefficients. The correlation between net income and price in econometric studies of contributions have, indeed, been large and negative.[59] Despite this fact, estimated standard errors in the cross-section studies have generally not been excessive, especially when micro data have been used.

The problem of separately identifying the price and income effects goes beyond mere multicollinearity, however. Because the tax rate is related by law to income, it is possible that conventional measures of multicollinearity are not sufficient. As Feldstein and Taylor (1976, p. 1208) note, "the problem of collinearity is limited to *linear* dependence. It is possible, however, that the association between price and economic income implies a more fundamental problem of nonlinear under-identification." In other words, it might be impossible to identify price and income effects if the postulated structural model of giving (usually log linear) is not correct. The relationship between price and net income is, of course, not even an exact nonlinear function; only taxable income and the marginal tax rate are exactly linked, and only then within the several tax-filing-status groups. The dependence of price on net income is disturbed by variations in itemization status, deductions, and exemptions. Still, the relationship is uncomfortably close, and it is useful to examine ways in which price and net income vary independently. Besides itemization status, the two most important sources of independent variation are differences in state income tax rates and changes in federal tax rates over time.

Because state income tax rates differ and not all states have income taxes, accounting for the state-tax treatment of contributions adds an important source of independent variation to the price variable. As Feenberg (1982, p. 11, table 1) shows, the combination of state and federal taxes caused the price of contributions for a hypothetical household making $15,000 in 1977 to vary from 0.80 to 0.70. At $30,000 the price varied from 0.68 to 0.58.[60] To illustrate the degree of variation in price and net

58. See, for example, Kahn 1960 and Vickrey 1962.

59. For example, the correlation in the 1975 tax file of itemizers used by Clotfelter and Steuerle 1981 was - 0.39 between net income and price (P50) and - 0.87 for the corresponding log values. The correlation was - 0.63 in Reece's (1979, p. 145) sample of itemizers and nonitemizers. The correlation for time-series data may be quite different, as illustrated by Schwartz's (1970a, p. 1279) positive correlations, ranging from + 0.62 to + 0.95.

60. Federal marginal tax rates for each income level were 0.2 and 0.32 (T_f) and maximum state subsidy rates (T_s) were 0.12 and 0.14, respectively. The combined price is $1 - T_s - T_f + T_s T_f$.

income that results from differences among individuals in deductions, exemptions, and state tax rates, table 2.21 shows the distribution of prices by net income for married taxpayers under 65 in 1970. Although any average of the price certainly declines with net income, there is some degree of variation at each income level.

Rather than using the price based directly on federal and state tax rates, Feenberg (1982) formed an instrument for the combined price in order to remove dependence of the price on personal characteristics such as marital status or other deductions. Such dependence, he argues, would tend to result in omitted-variable bias if some characteristics are not included in the estimating equation. The instrument is based on calculations of state tax subsidy rates evaluated for fixed income and deductions. Using this procedure Feenberg obtained price-elasticity estimates close to those obtained in earlier studies, but his ordinary least squares estimates are unusually small, making it difficult to be sure about the general effect of this estimation procedure.

A second method of obtaining independent variation in the price variable is to calculate prices over periods in which federal tax rates have changed. Effective tax rate schedules may be changed either by legislation or by inflation-induced bracket creep. Any use of contributions, tax, and income data over time—including Schwartz's (1970a) time-series analysis and Feldstein's (1975a) pooled analysis—would capture some of this kind of independent variation. Feldstein and Taylor (1976) sought more specifically to measure independent changes in the price of giving by aggregating data for 1962 and 1970 into classes with constant real incomes. For each of sixteen income classes they found that prices rose and contributions fell between 1962 and 1970, implying arc elasticities with a median of -1.92.[61] In order to account for shifts over time unrelated to price changes, they estimated equations of the form:

$$\ln(\overline{G_1}/\overline{G_0}) = a + b \ln(\overline{P_1}/\overline{P_0}) + u, \tag{26}$$

where $\overline{G_0}$ and $\overline{G_1}$ are average contributions for a constant-income class in the earlier and later year, respectively, and $\overline{P_0}$ and $\overline{P_1}$ are the corresponding average price terms, and u is an error term. Using data for 1962 and 1970, Feldstein and Taylor were able to take advantage of changes in tax law, in particular the 1964 reduction in tax rates, to capture independent changes in prices. As shown in table 2.22 this approach yielded price elasticities very much in the range of estimates using disaggregated data: from -1.34, for unweighted regressions using the price that reflects gifts of assets and dropping the lowest three income classes, to -1.58 for weighted regressions using all sixteen observations. However, when this same meth-

61. Values for the highest income class were not counted for this calculation. Arc elasticities were calculated as $(\ln G_{70} - \ln G_{62})/(\ln P_{70} - \ln P_{62})$. See Feldstein and Taylor 1976, p.1211, table 2.

Table 2.21 **Distribution of Returns by Net Income and Price, Married Itemizers under 65, 1970**

Price	Net Income				
	Under $10,000	$10,000–20,000	$20,000–50,000	$50,000–100,000	$100,000– or More
0.31	0	0	0	260	3,041
0.31–0.37	0	0	0	2,508	2,224
0.37–0.46	0	0	1,410	5,845	2,387
0.46–0.61	0	0	6,045	2,099	1,652
0.61–0.72	1	2,480	5,334	308	329
0.72–0.75	0	5,302	769	37	59
0.75–0.78	251	6,126	321	26	41
0.78–0.81	2,716	2,414	109	20	37
0.81–0.86	2,716	256	70	20	82
0.86–1.00	709	55	58	37	137

Source: Feldstein and Taylor 1976, p. 1209, table 1.

Note: Price reflects federal and state taxes. Net income is adjusted gross income minus federal tax liability with no contributions.

Table 2.22 **Price Elasticities Based on Changes in Contributions and Price for Constant-Income Classes, Selected Periods**

Specification and Sample	1962–70	1970–75	1962–75
Price reflecting gifts of cash and assets			
Unweighted regressions	−1.39	0.56	−0.81
	(0.19)	(0.68)	(0.06)
Weighted regressions	−1.58	−1.09	−0.63
	—[a]	(0.29)	(0.38)
Unweighted regressions dropping bottom 3 classes	1.34	0.43	−0.97
	—[a]	(0.74)	(0.29)
Price reflecting gifts of cash			
Unweighted regressions	−1.54	0.48	−0.84
	(0.21)	(0.74)	(0.26)

Source: 1962–70: Feldstein and Taylor 1976, p. 1212; 1970–75 and 1962–75: Clotfelter and Steuerle 1981, p.434, table 6.

Note: Standard errors are in parentheses.

[a]Not reported.

odology was applied using 1975 data (Clotfelter and Steuerle 1981), the implied elasticities were closer to zero and were generally subject to larger standard errors. As table 2.22 shows, for example, the weighted regression for 1970–75 implies an elasticity of −1.09, and the corresponding regression for the entire 1962–75 period yields an estimate of −0.63. The corresponding standard errors are 0.29 and 0.38. The large standard errors for the 1970–75 period may result from the comparatively small change in effective marginal tax schedules over the period. Rough as they are, the results in table 2.22 do lend general support for a negative price elasticity, but they add little to the precision of that estimate.

Using a panel of taxpayer returns, I applied this same methodology to the giving of individuals over time. For any one individual, changes in the price of giving over time result from changes in personal variables—income, deductions, marital status—and changes in the effective marginal tax schedule. The former source of variation does nothing to alleviate the potential identification problem, but the latter does. The basic logarithmic form of the giving equation implies that the ratio of giving will be related to the ratios of individual variables that change over time:

$$\frac{G_1}{G_0} = A\left(\frac{Y_1}{Y_0}\right)^a\left(\frac{P_1}{P_0}\right)^b e^{cx+v}, \tag{27}$$

where A is a constant reflecting a time trend, c is a vector of coefficients, x is a vector of variables measuring changes in individual variables or characteristics for which growth rates in giving may differ, a and b are elasticities, and v is an error term. To the extent that omitted variables such as religion and community characteristics remain relatively constant over time, a model such as (27) mitigates the possible bias resulting from their omission. After taking logarithms, I estimated the model of changes in giving for 4105 taxpayers who itemized deductions in 1968 and 1970, using the Treasury's Seven-Year Panel of Taxpayers. Because of new features embodied in the 1970 tax law (increased exemptions, a low-income allowance, and a significantly reduced tax surcharge), changes in the price of giving during this period were largely affected by exogenous influences, thus enhancing the opportunity to identify the price effect. Adding \$10 to all reported giving yielded the following estimated equation:

$$
\begin{aligned}
(28)\quad \ln (G+10)_{70} - \ln (G+10)_{68} &= \underset{}{0.122} + \underset{(0.041)}{0.449}\,(\ln Y_{70} - \ln Y_{68}) \\
&\quad \underset{(0.053)}{} \\
&\quad - \underset{(0.269)}{0.388}(\ln P_{70} - \ln P_{68}) + \underset{(0.037)}{0.037}\,MRD + \underset{(0.0197)}{0.0065}(D_{70} - D_{68}) \\
&\quad - \underset{(0.029)}{0.129}(\text{age } 35\text{–}54) - \underset{(0.037)}{0.183}(\text{age } 55\text{–}64) - \underset{(0.053)}{0.216}(\text{age } 65+), \\
&\quad R^2 = 0.059,
\end{aligned}
$$

where contributions and net income are expressed in 1970 dollars, D is the number of dependents, and there are dummy variables for married couples *(MRD)* and age of taxpayer.[62] Both the implied income elasticity (0.449) and the price elasticity (-0.388) are smaller than most estimates in cross-section studies. The standard error for the price term is especially large, implying a 95 percent confidence interval on the elasticity of 0.139 to -0.915. The age dummies suggest that rate of increase in giving drop with age.

These estimates are similar to those based on changes for aggregate income classes in that the estimated price elasticities are smaller than typical cross-section estimates and the standard errors are relatively large. The similarity of these two sets of results strongly suggests that our knowledge about the price elasticity of giving is not as precise as most cross-section analysis would suggest. The lower point estimates implied by the analysis of changes in individual giving are roughly consistent with the aggregate elasticities presented in table 2.22, but there are several alternative expla-

62. Price and income elasticities from this equation are presented in Clotfelter 1980b, p. 331, table 2.

nations for those estimates. First, the sample used for estimating the individual change model included only low- and middle-income itemizers, for whom the true price elasticity may be smaller in absolute value.[63] Second, lags in the adjustment of giving behavior to changes in price and income would tend to show up as lower estimated elasticities. Other estimates of the adjustment coefficient suggest that the two-year span covered by equation (28) would not be long enough to accommodate most of the adjustment in giving.[64] Finally, the smaller point estimates implied by the change equations may result from an errors-in-variables problem arising from the failure of actual changes in price to measure "perceived" changes, where the latter is the correct variable. That smaller price elasticities are estimated in change equations for shorter intervals supports this hypothesis, but it is also consistent with the lagged-adjustment hypothesis.

In summary, the statistical identification of the price and income effects on giving lies at the heart of econometric work to assess the impact of tax policy on contributions. Tests to verify the effect of price involve maximizing the amount of independent variation in tax rates. While they tend to leave more doubt about the precise price elasticity, these tests strongly support the existence of an independent tax-defined price effect on charitable giving.

Endogeneity of Tax Variables

Another important econometric problem encountered in empirical analysis of charitable contributions is that the policy variables of interest—price and tax liability—are dependent on the amount of contributions made. As figure 2.4 above shows, the budget set facing the household typically is nonlinear. For itemizers, increased contributions may decrease the marginal tax rate and thus increase the price of giving at the margin. In addition, taxpayers whose contributions cause them to itemize their deductions experience an inframarginal decline in price. Similar effects apply to total tax liability and thus to net income. Including actual values of price and income as explanatory variables in a regression explaining contributions would lead to simultaneity bias, and resulting estimates would be inconsistent.[65] In order to obtain consistent estimates, the measure of price must be made independent of the amount contributed. Three basic approaches have been used to achieve consistent results: use of a "first-dollar" price of giving, use of instrumental variables for the

63. See section 2.5.1 for a discussion of variations in the price elasticity.

64. See section 2.5.1 for a discussion of a partial-adjustment model of giving.

65. See Theil (1971), pp. 361–64) for a discussion of consistent estimates. See Feldstein 1975a and Fedlstein and Taylor 1976 for discussions of this bias in models of charitable giving.

marginal price, and a nonlinear procedure that accounts for the entire schedule of prices relevant to an individual.

The first-dollar price is defined as the price applying to an individual's first dollar of giving, and it corresponds to the slope of the budget set in figure 2.3 at the y-axis.[66] Although it provides an exogenous measure of price, it differs from the marginal price for some taxpayers. Obviously, the greater the difference, the less reliable the first-dollar measure of price. For the majority of taxpayers—those who do not itemize—the first-dollar price is exactly the marginal price. A difference is possible only for those who itemize deductions. The illustrative budget set displayed in table 2.11 for an itemizer with average income in 1980 suggests that the contribution required to cause the first-dollar and marginal price to vary more than 10 percent would be very large—on the order of seven times the average contribution for that class, or about $5860.

A more direct test of the accuracy of the first-dollar price is given in table 2.23, which compares calculated prices for a random sample of itemizers in 1970. For the purpose of analyzing the pattern of prices, itemizers are divided into several classes. The most numerous group of itemizers are those who would owe tax and itemize their deductions whether or not they had charitable deductions. This, of course, is the usual case represented by a convex budget, such as that set shown in figure 2.3. In the 1970 sample of itemizers, the first-dollar price was a very accurate measure of the marginal price. Whereas the average marginal price faced by this group was 0.782, the average first-dollar price was 0.779. Obviously the vast majority of such taxpayers reach an equilibrium point on the first segment of their convex budget set. Similarly, the first-dollar price and marginal price are within one percentage point for three other groups of itemizers: those who itemize even though it appears to be advantageous not to (line 3),[67] those whose returns are nontaxable in any case (line 4), and the few for whom contributions make the difference between nontax status and nonitemization (line 6). For two groups of itemizers, however, the first-dollar price is not a very accurate measure of the marginal price. For the few taxpayers whose contributions reduce taxes to zero (line 5), the first-dollar price understates the marginal price. Much more important are those taxpayers who would not find it advantageous to itemize without their charitable contributions (line 2). These taxpayers face nonconvex budget sets, as illustrated above in figure 2.7. Such borderline itemizers face a marginal price (0.787) slightly higher than that faced by itemizers in group 1

66. In the first-dollar approach, both price and income are calculated as if no contributions are made. Because it is defined analogously, income is not discussed further in this section.

67. These taxpayers may itemize because of state tax considerations or because of requirements covering married couples filing separately.

Table 2.23 **Average First-Dollar Price (P_1) and Marginal Price (P_2) for Itemizers, 1970**

Description	Percentage of Itemizers	Average Values		
		P_1	P_2	$(P_1 - P_2)$
Taxable returns				
1. Excess itemized deductions positive with or without contributions	88.1	0.779	0.782	−0.003
2. Excess itemized deductions positive with contributions, not without contributions (borderline itemizers)	6.7	0.993[a]	0.787	+0.206
3. Excess itemized deductions negative (itemization is not advantageous for federal taxes alone)	1.3	0.823	0.824	−0.002
Nontaxable returns				
4. Nontaxable with or without contributions	3.0	1.000	1.000	0.000
5. Nontaxable with contributions, but taxable without	0.8	0.859	0.987[b]	−0.128
6. Nontaxable with contributions; without contributions taxable and negative excess itemized deductions	0.0[c]	1.000	0.991[b]	+0.009
TOTAL (N = 7063)	100.0			

Source: Seven-Year Panel of Taxpayers; see Clotfelter 1980b, p. 326, table 1.

Note: Excess itemized deductions are defined as itemized deductions minus the greater of the standard deduction and the low-income allowance.

[a]For a few taxpayers at the margin of itemization, the $10 of contributions used to calculated tax price was sufficient to change that status and thus result in a price not equal to one.

[b]For a few taxpayers, actual tax liability was under a dollar; thus the marginal tax rate was a small positive number, although reported tax was zero. Most of these taxpayers had tax credits which most likely would have covered all tax liability.

[c]Less than 0.05.

(0.782), but their first-dollar price greatly overstates that marginal price (+0.206).

These calculations show that the first-dollar price of giving gives a very close approximation to the marginal price in most cases. The major error to which the first-dollar measure is susceptible is overstatement of the marginal price in the case of borderline itemizers. This has two important implications for econometric studies using a first-dollar measure of price. First, in samples containing both itemizers and nonitemizers, it is incorrect to assume that the itemization decision is exogenous with respect to contributions. For itemizers who chose that status only by virtue of the contributions they made, the correct first-dollar price is one. Since these taxpayers are more likely to be relatively generous givers, assuming that their itemization is exogenous and assigning them a price less than one will impart a negative bias to the price elasticity.

The effect of assuming that itemization is exogenous can be illustrated using the National Study of Philanthropy. Boskin and Feldstein (1977 and 1978), like Dye (1978), took itemization status to be exogenous. Their estimated price elasticity of −2.54, shown in table 2.24, is comparatively large. In order to examine the possible effect of their assumption, I reesti-

Table 2.24 **Alternative Treatment of Borderline Itemizers from the National Study of Philanthropy**

		Reestimation		
	Boskin-Feldstein (eq. 1)	Replication of Boskin-Feldstein Equation	Price = 1 for borderline itemizers (N = 30)	Borderline Itemizers Omitted
Equation	(A)	(B)	(C)	(D)
Log of net income	0.69	0.73	0.79	0.73
	(0.06)	(0.06)	(0.06)	(0.06)
Log of price	−2.54	−2.69	−2.20	−2.55
	(0.28)	(0.27)	(0.27)	(0.27)
Age 35–54	0.46	0.42	0.43	0.44
	(0.07)	(0.07)	(0.07)	(0.07)
Age 55–64	0.75	0.69	0.71	0.71
	(0.09)	(0.09)	(0.09)	(0.09)
Age 65+	0.86	0.90	0.90	0.91
	(0.09)	(0.09)	(0.09)	(0.09)
Intercept	−2.54	−2.33	−2.88	−2.40
	(0.28)	(0.53)	(0.53)	(0.53)
N	1621	1691	1691	1661
R^2	0.30	0.31	0.30	0.31

Source: Boskin and Feldstein 1977, p. 352.

Note: Household incomes of between $1000 and $30,000. Dependent variable is ln (G + 10).

mated their equation using the same data set. I calculated federal taxes and marginal tax rates from data on income, mortgage and house value, and exemptions. Other deductions were based on averages for each income class. Taxpayers were classified as borderline itemizers if their contributions made the difference between itemized deductions exceeding or being less than the applicable standard deduction for the household.[68] Equation (B) represents an attempt to replicate the Boskin-Feldstein sample and specification. Probably because of differences in tax-calculation algorithms, the samples and estimates differ slightly. The reestimated price elasticity assuming exogenous itemization status is -2.69. The last two equations reflect two methods of mitigating the sample selection bias problem. In equation (C) borderline itemizers were assigned the correct first-dollar price of one. The estimated price elasticity is -2.20, a value significantly different from that in equation (B). Equation (D) was estimated without borderline itemizers in the sample. The estimates from this equation are not significantly different from those in the replication equation, however. Because it includes the entire sample, the preferred equation is (C), the estimates of which support the notion that the incorrect treatment of borderline itemizers leads to a negative bias in the price elasticity. The resulting estimate of this price elasticity is still quite large relative to other empirical work on this question.

The second implication of the problem for borderline itemizers is that there is a sample selection bias in any sample restricted to itemizers, such as samples of tax returns. Any sample of itemizers includes some taxpayers who are in the sample only because their contributions were large enough to put their total deductions over the allowable standard amount. As an illustration of the sample-selection-bias problem, consider the true giving equation $G = XB + u$, where X is a vector of explanatory variables, B is a vector of coefficients, and u is an error term. For this model the conditional expectation of giving for the population is $E(G_i \mid X_i) = X_iB$. However, the comparable expectation for itemizers only is

$$E(G_i|X_i, I_i > S_i) = X_iB + E(u_i|I_i > S_i), \tag{29}$$

where I_i is an individual's possible itemized deductions and S_i the maximum of the standard deduction and the low-income allowance. For borderline itemizers, contributions will tend to be unusually large given their first-dollar price of one due to the fact that such itemizers, in essence, are included in the sample by virtue of these relatively large contributions. At the same time, similar taxpayers making smaller contributions and thus choosing not to itemize would be excluded from the sample. The result of

68. For a futher description of the sample and tax calculation method, see Appendix A. Out of the 1691 households included in table 2.24, equations B and C, 30 were classified as borderline itemizers.

including all itemizers would then be a positive correlation between the first-dollar price and the error term. This sample selection problem can be dealt with by techniques specifically designed for the purpose or by eliminating them from the sample.[69]

A second approach to the problem of endogeneity in the tax variables is the use of instrumental variables. Feenberg's (1982) instrumental-variables procedure using state tax rates, discussed above, is one such approach. Although it is open to the possibility of underidentification discussed by Feenberg, a more conventional procedure would be simply to use the first-dollar price as an instrument for the true marginal price. When this approach was taken for a sample of itemized returns for 1970, the point estimates of the ordinary least squares and instrumental-variables equations were quite close, which is consistent with the similarity of first-dollar and marginal prices suggested by table 2.21.[70]

A third approach to obtaining consistent estimates is a nonlinear technique that embodies the nonlinearity of budget constraints. Following the work of Hausman and others in estimating models of labor supply,[71] Reece and Zieschang (1982) have estimated the effect of taxes on contributions using nonlinear budget constraints. Their approach recognizes that the amount of contributions an individual makes depends on the entire budget set. When the individual is on any given segment of the set, he behaves just as if he were facing a proportional income tax with the same rate, but with a credit added. This credit, or "rate structure premium," arises from the fact that the actual tax differs from the hypothetical proportional tax, in that not all dollars are taxed at the same proportional rate.[72] Explicit utility functions are then derived by applying Roy's identity to a simple linear demand function for giving. The utility-maximizing consumption point can then be found on the budget set. For convex budget sets, which apply to those who would itemize in any case, this is a fairly straightforward matter of comparing slopes. For nonconvex budget sets, including the case of borderline itemizers, explicit utility calculations must be made. The estimation routine is a nonlinear maximum-likelihood method patterned after Hausman's work. Although the complexity of this approach virtually dictates the use of a simplistic linear demand function, the approach deals explicitly with borderline itemizers and yields consistent estimates. Using a sample of 685 households from the Survey of Con-

69. See Heckman 1979 for a discussion of estimation in the presence of sample-selection bias.

70. For a sample of 4492 itemizers, the ordinary-least-squares estimates for the price and income elasticities were -1.68 (S.E. = 0.29) and 0.505 (S.E. = 0.063). The instrumental variables estimates were -1.72 (S.E. = 0.31) and 0.500 (S.E. = 0.064), respectively.

71. See Hausman 1981 for a description of this work.

72. Actual net income plus this rate-structure premium is the amount comparable to Hausman's "virtual income."

sumer Expenditures, Reece and Zieschang (1982) obtained estimates implying at mean values a price elasticity of -0.91 and an income elasticity of 1.31. Compared to conventional Tobit estimates obtained by Reece (1979) for a similar sample and dependent variable, the price elasticity for this nonlinear method is smaller in absolute value (-0.91 compared to -1.19), and the income elasticity is larger (1.31 compared to 0.88). Given the sensitivity of estimates in other models to sample and variable specifications, it is impossible to determine how much of the difference is attributable to the estimating techniques used and the differences in calculating elasticity values.[73]

Systematic Reporting Errors

Estimates of aggregate contributions based on amounts reported by donors consistently exceed estimates based on gifts received by charitable organizations, strongly suggesting that donors tend to overstate their contributions. Furthermore, there is some reason to believe that the tendency to report too much may vary by itemization status and tax rate. Vickrey (1962, p. 50), for example, suggests that itemizers may be more careful in recording gifts than nonitemizers. Such differences in memory or record keeping would bias survey findings and imply that at least part of observed differences in giving, such as those shown in table 2.9, are not attributable to a price response. Differences in tax rates may also affect reporting. Since the tax benefit from overreporting is comparable to that obtained from actual increases in giving, it is possible that estimated price elasticities of giving embody an overreporting effect as well as an effect on actual contributions.[74]

In order to explore this possibility, I estimated simple logarithmic equations explaining reported contributions before and after IRS audits.[75] Table 2.25 presents the estimated price and income elasticities for both measures of contributions and four broad income classes. Although reported contributions in each income class are indeed higher than the amounts allowed by auditors, the estimated price and income elasticities are quite close and well within the corresponding standard errors in every case. These results suggest that the tendency to overstate contributions does not rise with the marginal tax rate and that the use of reported contributions does not lead to systematic bias of the price effect.

73. Elasticities in Reece 1979 are based on the percentage change in expected contributions, while elasticities calculated by Reece and Zieschang 1982 are based on changes in giving by a representative household.

74. Kahn (1960, p. 67) suggests that taxpayers might have overstated gifts in the 1940s and 1950s due to high tax rates. Schwartz (1970a, p. 1269) also notes the possibility of biased estimates from overreporting.

75. I am indebted to Eugene Steuerle for discussions on this topic. The data were taken from the 1969 Taxpayer Compliance Measurement Program and were analyzed as a part of a Treasury Department contract on tax administration. For a description of the data, see Clotfelter 1983a.

Table 2.25 **Estimated Price and Income Elasticities Using Reported and Corrected Contributions**

Income Class	Sample Size	Mean of Contributions		Price Elasticity		Income Elasticity	
		Reported	Corrected	Reported	Corrected	Reported	Corrected
$3,000 to 20,000	21,789	227	211	0.06	−0.06	1.39	1.39
				(0.37)	(0.36)	(0.06)	(0.06)
Over $20,000 to 50,000	11,952	1,417	1,377	−1.11	−1.09	1.62	1.59
				(0.14)	(0.14)	(0.11)	(0.10)
Over $50,000 to 100,000	4,336	4,869	4,720	−1.43	−1.42	1.08	1.07
				(0.12)	(0.12)	(0.15)	(0.15)
Over $100,000	1,020	49,351	47,890	−1.60	−1.59	1.08	1.10
				(0.16)	(0.16)	(0.11)	(0.11)

Source: 1969 Taxpayer Measurement Compliance Program file. See Clotfelter 1983a for a description of the data set.

Note: Other included variables were dummy variables for age, region, and marital status. Standard errors are in parentheses.

Other Issues

Several less significant issues have come up in the estimation of econometric models of giving. Three discussed briefly below are the modifications of the logarithm of giving, the problem of heteroskedasticity, and the omission of age in equations using aggregate data. In studies of individual contributions, observations of zero contributions present a special problem. Where such observations represent a sizable portion of the sample, such as in Reece's (1979) sample, a technique that accounts for the zero constraint like Tobit is called for. Where only a small porportion of the sample gives nothing, ordinary least squares is appropriate, but the zero observations make it impossible to take logarithms directly. Transformations to allow a logarithmic form include adding $1 or $10 to all giving amounts or setting a minimum contribution, based in part on convenience and in part on the idea that virtually everyone gives something. Because of the steepness of the logarithmic function in the vicinity of one, Boskin and Feldstein (1977) opted for adding $10. In other words, the constant elasticity function becomes less plausible when proportional changes in any variable become too large. Over the range of contributions values examined in econometric studies, even for samples dominated by low- and middle-income households, the differences between these alternative forms do not appear to be large.[76]

A second issue, raised by Hood, Martin, and Osberg (1977), is heteroskedasticity in the errors in models using aggregated data. Because some observations in the samples used by Feldstein (1975a) and Abrams and Schmitz (1978), for example, are based on many more returns than others, the variance of the error term may not be constant. In order to obtain consistent estimates, it is necessary to apply a generalized least-squares weighting of the observations. Another closely related problem, discussed by Feldstein (1975a), is the likelihood that itemizers with very low incomes are unusual. His solution was to exclude observations with average incomes below a given level.[77] In order to examine the sensitivity of estimates based on pooled aggregate data to adjustments such as these, a data set similar to that used by Feldstein was used to obtain new estimates.[78]

76. Boskin and Feldstein (1977, pp. 1444–45) report price-elasticity estimates based on three forms of the dependent variable (standard errors shown in parentheses): ln $(G+10)$: -2.405 (0.259); ln $(G10)$: -2.506 (0.266); and ln $(G1)$: -2.872 (0.371), where $G10$ and $G1$ are equal to the greater of reported giving and $10 and $1, respectively.

77. In most equations Feldstein also excluded taxpayers with incomes over $100,000 on the basis that their economic incomes were poorly measured by adjusted gross income and that the opportunities of giving through other mechanisms such as trusts made it difficult to calculate their price of giving (Feldstein 1975a, p. 86).

78. For a description of the data, see the Appendix A.

Equations of a basic logarithmic form were estimated weighted and unweighted and for different income ranges. The weighting factor used in the weighted regressions was the square root of the number of taxpayers. The estimated price and income elasticities are shown in table 2.26. Of those shown, equation (E) is the same basic equation and sample as that employed by Feldstein (1975a), except that the income limits are expressed in 1972 dollars rather than 1967 dollars. The estimated elasticities are quite close: −1.18 (compared to −1.24) for price and 0.76 (compared to 0.80) for income. For each pair of equations, the effect of weighting the observations is to decrease the income elasticity and increase the size of the price elasticity in absolute value. These changes are by far the greatest in equations (C) and (D). In contrast, the effect of limiting the sample at the lower level or at both the top and bottom is to reduce the absolute value of the price elasticity and to increase the estimated income elasticity. Except for equation (C), the estimates are reasonably well clustered. Yet the differences are still much greater than would be suggested by the relatively small estimated standard errors. Compared to estimates using individual data, these estimates appear less robust. Taken together, however, these results do appear to be consistent with other estimates. On the basis of consistency of estimation and avoidance of bias by the inclusion of low-income itemizers, equations (D) and (F) would seem to be preferred.

Table 2.26 **Estimated Price and Income Elasticities of Giving, Pooled Aggregate Data, 1948–80**

Equation, Sample and Estimation	Estimates			Sample Size
	Price Elasticity	Income Elasticity	Trend	
Full sample				483
(A) OLS	−1.42	0.75	0.0093	
	(0.07)	(0.03)	(0.0026)	
(B) Weighted	−1.69	0.51	−0.0027	
	(0.07	(0.02)	(0.0013)	
$Y >$ \$4,000				393
(C) OLS	−0.73	1.16	−0.0020	
	(0.06)	(0.03)	(0.0021)	
(D) Weighted	−1.42	0.67	−0.0077	
	(0.08)	(0.03)	(0.0012)	
\$100,000 $>$ $Y >$ \$4000				317
(E) OLS	−1.18	0.76	−0.0051	
	(0.21)	(0.02)	(0.0012)	
(F) Weighted	−1.34	0.60	−0.0078	
	(0.08)	(0.02)	(0.0010)	

Not only do they yield similar estimates, but their elasticities are also close to that implied by equation (E), the basic equation used by Feldstein (1975a).[79]

2.6 Individual Giving in Foreign Countries

An important step towards a more complete understanding of the effect of fiscal policies on charitable contributions is to extend the econometric analysis of giving beyond the United States. In so doing, it would be possible to observe much wider variations in the tax treatment of contributions, the level of government services, and private institutional arrangements than is possible in analyzing one country alone. In this vien, the present section presents some available international comparisons of contributions by individuals. One fact that becomes quite clear is that available data on charitable giving in other countries is much less complete than is the case for the United States. The present section deals in turn with certain institutional differences relevant to charitable giving among selected Western countries and then with econometric studies of individual contributions for two countries.

2.6.1 Private Giving and Institutional Differences

For the purpose of comparison, it is useful to summarize available information on contributions and institutional characteristics for various countries. Attention is focused on three countries—Britain, Canada, and the Federal Republic of Germany—and additional information on tax laws is presented for other countries. In Britain, the tax law allows deductions for some charitable gifts, but the law differs in three notable respects from the U.S. treatment. First, the gifts must be in the form of a "deed of covenant," whereby the taxpayer agrees to make payments to a charitable organization for at least seven years. Although the amount of the gift is

79. A final issue also relevant to the estimation of contributions equations with aggregate data is the effect of omitting age variables in estimating price and income elasticities. As shown by all of the work with individual data on contributions, age is an important influence, with contributions rising steadily with age. In aggregate cross sections of giving, measures of age have been omitted. Since age and income are strongly, albeit not linearly, related, the omission of age in these equations could bias the income or price elasticities. In order to examine what, if any, effect this omission might have, I added a measure of the age distribution of each income class to the pooled equation presented above. For the years 1968 to 1980, it was possible to measure the ratio of over-65 exemptions to taxpayers exemptions, giving the approximate proportion of adults over 65. When this measure was added to the aggregate giving equation, the income elasticity rose from 0.35 to 0.98 and the price elasticity fell in absolute value from -2.62 to -0.07, the latter being insignificant. The relatively small variation in tax schedules tended to make the estimates from this sample quite unstable, however, and it is thus hard to know what to make of this result. In addition, the studies of giving based on disaggregated data all include age variables without having a similar effect on the price elasticity.

fixed in advance, the taxpayer may retain some flexibility as to the ultimate recipient by directing contributions in the covenant to an umbrella organization such as the National Council on Social Services and later specifying the precise donee. Second, contributions have not always been deductible at the top marginal tax rate, as is the case in the United States. From 1946 to 1981 covenanted gifts were deductible only at the lower basic tax rate, but they are now deductible at the surtax rate as well. Finally, the mechanics of the tax subsidy are more direct than in the United States, with the government sending checks directly to charities for the subsidy portion of contributions. The taxpayer deducts from his contribution the tax on the gift, and the government pays to the charity the amount of that saving.[80]

The Canadian and German tax provisions both allow for a direct deduction of contributions in calculating taxable income. Contributions are generally limited to 5 percent of income in Germany and 20 percent in Canada, although there is no limit for some institutions in Canada (Bird and Bucovetsky 1976, especially pp. 16–23; Paqué 1982a, p. 3). The most notable differences from U.S. tax treatment occur in Germany. First, the German law allows contributions to some political organizations to be deducted. Second, members of organized religious bodies—the vast majority in Germany—pay a "church tax" calculated as a percentage of regular tax liability (Paqué, 1982a). Needless to say, these differences would be expected to have an impact on the amount and composition of deductible contributions.

Deductions for contributions are also allowed in Australia, France, and Japan. In Japan contributions to the Community Chest Society are deductible subject to both a floor and a percentage limitation. By contrast, contributions are generally not deductible in Italy and Sweden. One study of tax differences across countries concluded that "direct and indirect governmental support of the private philanthropic sector varies inversely with the involvement of government itself in providing social services" (Arthur Andersen and Company 1977, p. 2975).

The differences in tax law and the size of government are reflected in differences in private giving among countries. In comparison to the United States, these countries have significantly lower levels of charitable giving and, correspondingly, less dependence on private contributions. Although differences in data and definitions make precise comparisons difficult, it is possible to estimate giving as a percentage of personal income for the United States and three other countries. Personal contributions were about 0.2 percent of personal income in Britain in 1975. The compa-

80. Descriptions of British tax law regarding contributions were taken from Owen 1964, pp. 337-38; Culyer, Wiseman, and Posnett 1976, pp. 36, 44–46; Obler 1981, pp. 27–28; and correspondence by the author with E. B. Butler, Inland Revenue, 18 May 1982.

rable figure in Canada for 1979 was about 0.5 percent. In Germany, nonreligious giving in 1974 was 0.2 percent of gross income, and the church tax raised another 1.5 percent, for a total of 1.7 percent of income directed toward charitable organizations. Contributions in the United States, in comparison, have been about 2 percent of personal income.[81] At the same time, it is clear that government expenditures provide a large share of support in these countries, whereas these functions are heavily dependent on private support in the United States. For example, the Canadian government provides the support for most of the country's Catholic parochial schools, and Canadian universities receive very little private support other than from fees (Bird and Bucovetsky 1976, p. 5). Similarly, the government provides substantial support in the areas of health, education, welfare, and the arts in Britain and Germany. In addition, the rise of government activity has been accompanied by declines in private giving. Falush (1977, p. 41) notes, for example, that the ratio of giving to personal income in Britain fell by half between 1934 and 1975, a period of substantial growth of government. Although their effects may not be precisely measurable, such differences in tax laws and government activity should be considered in evaluating econometric studies of giving in other countries.

2.6.2 Econometric Analysis

Two econometric studies of charitable giving have been undertaken for other countries, one for Canada and one for Germany. Both employed published data from tax returns to yield a pooled time-series/cross-section sample of class averages. Hood, Martin, and Osberg (1977) used annual data on itemized deductions for various income classes covering the period 1968 to 1973. Taxable and nontaxable returns were entered separately, and taxpayer classes with incomes over $100,000 were omitted. With a sample of 248 observations, the resulting estimated equation is:

$$\begin{aligned}(29)\quad \ln G = {} & -7.99 + 0.521 \ln Y - 0.862 \ln P \\ & \quad (0.757) \quad (0.038) \qquad (0.201) \\ & + 0.462 \ln K - 0.065 \text{ Trend} - 0.810\, RF, \\ & \quad (0.051) \qquad (0.050) \qquad (0.222) \\ & \overline{R_2} = 0.88,\end{aligned}$$

where G, Y, and P are average values of contributions, net income, and price, as previously defined; K is the percentage of income from capital

81. Sources for calculations were: Britain: Falush 1977, p. 331, which gives a ratio of 0.224 percent for personal disposable income; Canada: Canada 1981, table 2, based on total income of $177,577 million and contributions of $885 million; Germany: Paqué 1982a, pp. 5, 7 and unpublished information provided by Karl-Heinz Paqué; and U.S.: *Giving U.S.A.* 1981, p. 36, and U.S. Council of Economic Advisers 1983, p. 185. For the U.S. the ratio of individual giving to personal income was 2.0 percent in 1970 and 1.9 percent in 1982.

for the class; and *RF* is a dummy variable for the postreform years 1972 and 1973. The estimated income elasticity is 0.52, somewhat below most estimates for the United States. The implied price elasticity, −0.86, is also smaller than those implied by most studies, but the large standard error implies a 95 percent confidence interval of −0.47 to −1.26, making it impossible to reject the hypothesis that the price elasticity is in fact −1.[82] Considering the important differences between Canada and the United States in the sources of support for certain nonprofit institutions, the similarity between these estimates and others obtained for the United States is striking.

In a second econometric study, Paqué (1982a) analyzed a similar pooled sample of contributions in the Federal Republic of Germany for five years between 1961 and 1974. After eliminating the six lowest income classes for each year, he obtained a sample of forty observations. Using weighted least squares, he estimated the equation (Paqué 1982a, p. 16, table 1, equation 5):

$$\ln G = -12.48 + \underset{(0.018)}{1.274} \ln Y - \underset{(0.128)}{1.378} \ln P + \underset{(0.044)}{0.308}\, YL, \tag{30}$$

where *YL* is national income per employee. The implied income elasticity of 1.27 is much larger than most comparable estimates, and the price elasticity is somewhat larger than the median of estimates from previous work. Paqué's explanation (p. 25) is that these differences reflect the virtual exclusion of religious giving from the German contributions data by virtue of the separate "church tax." Given the lower income elasticity of religious giving obtained in the studies cited elsewhere in this chapter, this hypothesis seems quite reasonable.

In a companion study Paqué (1982b) examined the crowding-out hypothesis for Germany, using public-welfare expenditures as a measure of government activity. His results provide no evidence that crowding out had occurred, which is consistent with the findings presented in section 2.4 for the pooled sample with a time trend. It is interesting that such tests for single countries reject the crowding-out hypothesis while, at the same time, there seems to be such a strong negative correlation between contributions and size of government across countries.

82. The authors appear to disregard this wide confidence range in contrasting their results with previous estimates in the range of "-1.15 to -1.17" and in stating that an elastic demand curve in the case of contributions "strains credulity" (Hood, Martin, and Osberg 1977, pp. 660–61).